

**ATTACHMENT C.**

**APPENDIX 1**

**CEMENT, PLUGGING, AND WELL  
HISTORIES OF ALL WELLS IN THE AOR  
THAT PENETRATE THE INJECTION OR  
CONFINING HORIZONS**

**OSCEOLA AND MECOSTA COUNTY, MICHIGAN**

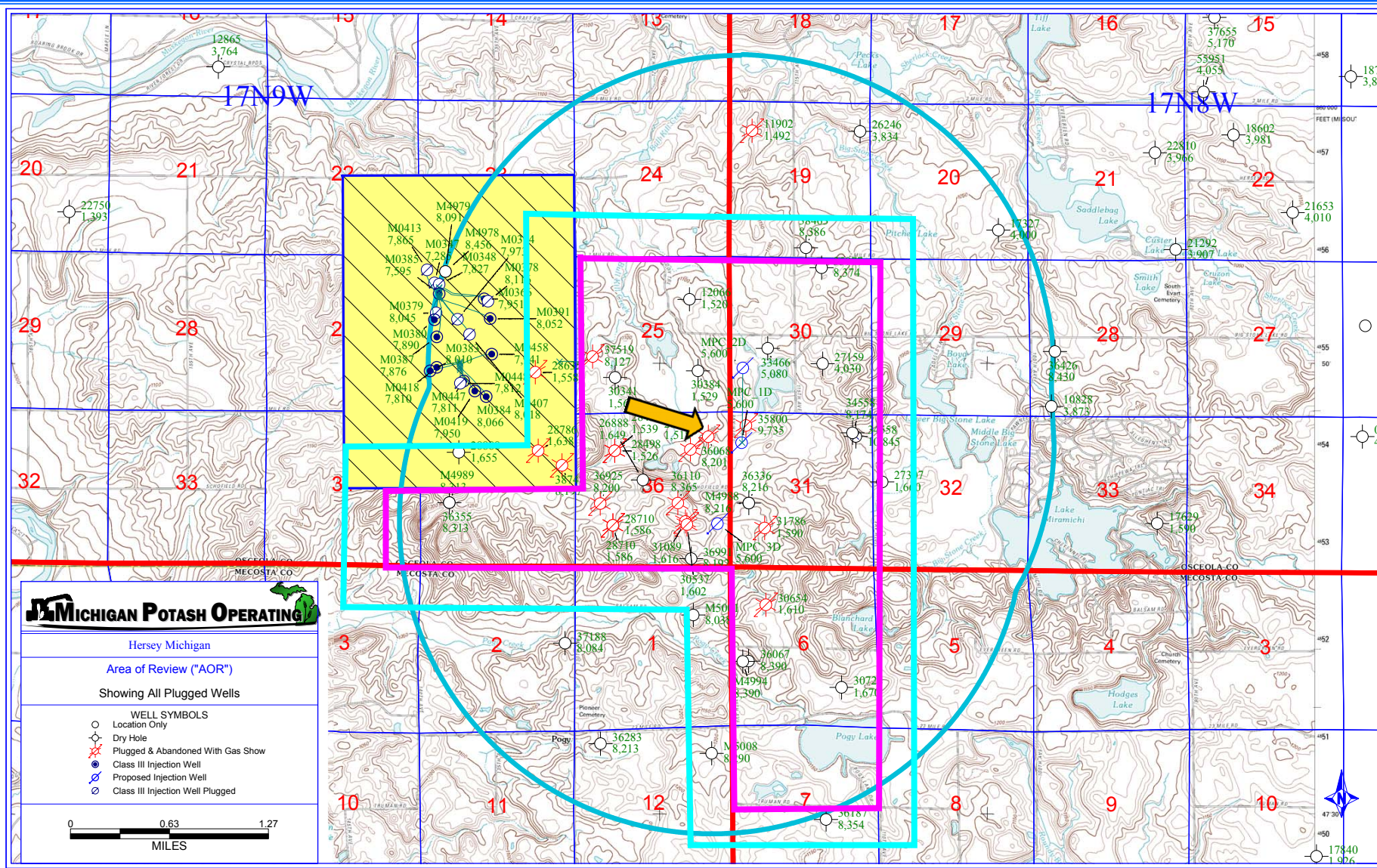
**THE UNITED STATES POTASH PROJECT  
APRIL 2015**

## PLUGGING AND WELL HISTORY REVIEW INDEX

APPENDIX TAB LETTER	Review Check	TRS	API Number	Permit Number	Well Name and Number	Total Depth	Formation at Total Depth	Drill Date	Well Status	Well Type	WH_Lat	WH_Long	Operator Name
Z		17N-9W-36	21-133-3611-00-000	36110	THOMPSON 3-36	8366	CINCINNATIAN	Oct-82	INACTIVE	NATURAL GAS WELL	43.8203	-85.3311	Marathon Oil Co.
A		17N-9W-36	21-133-36068-00-00	36068	BABCOCK ET AL 1-36	8200	CABOT HEAD	Sep-83	INACTIVE	NATURAL GAS WELL	43.8265	-85.3272	Marathon Oil Co.
B		17N-9W-36	21-133-36925-00-00	36925	BALDINO 1-36	8200	CABOT HEAD	Sep-83	INACTIVE	NATURAL GAS WELL	43.8203	-85.341	Marathon Oil Company
H		17N-9W-36	21-133-36991-00-00	36991	HODGES ET AL 1-36	8198	CLINTON	Oct-83	INACTIVE	DRY HOLE	43.8152	-85.3294	Marathon Oil Co.
doesn't penetrate		17N-9W-36	21-133-26888-00-00	26888	GREIN, DONALD 1	1649	BROWN LIMESTONE	Aug-67	INACTIVE	DRY HOLE	43.8225	-85.3356	Consumers Energy Company
doesn't penetrate		17N-9W-36	21-133-31089-00-00	31089	THOMPSON, DON; HODGES, FRANK; SMIT	1616	MICHIGAN STRAY	Jul-76	INACTIVE	NATURAL GAS WELL	43.8186	-85.3301	Mutch Harry L
doesn't penetrate		17N-9W-36	21-133-30537-00-00	30537	THOMPSON, DON; HODGES, FRANK; SMIT	1602	MARSHALL	Nov-75	INACTIVE	NATURAL GAS WELL	43.8183	-85.3299	Mutch Harry L
doesn't penetrate		17N-9W-36	21-133-2871-00-000	28710	THOMPSON & RANDOLPH 1	1586	MICHIGAN STRAY	Dec-71	INACTIVE	NATURAL GAS WELL	43.8182	-85.3394	Mutch Harry L
doesn't penetrate		17N-9W-36	21-133-28710-01-00	28710	THOMPSON & RANDOLPH 1	1586	MICHIGAN STRAY	Dec-71	INACTIVE	NATURAL GAS WELL	43.8182	-85.3394	Mutch Harry L
doesn't penetrate		17N-9W-36	21-133-28498-01-00	28498	GREIN, DONALD 1	1539	MICHIGAN STRAY	Aug-71	INACTIVE	NATURAL GAS WELL	43.8252	-85.3392	Hersey Oil and Gas Co.
doesn't penetrate		17N-9W-36	21-133-28498-00-00	28498	GREIN, DONALD 1	1526	MICHIGAN STRAY	Aug-71	INACTIVE	NATURAL GAS WELL	43.8252	-85.3392	Hersey Oil and Gas Co.
doesn't penetrate		17N-9W-36	21-133-28365-00-00	28365	THOMPSON, EDITH 1	1518	MICHIGAN STRAY	Jun-71	INACTIVE	NATURAL GAS WELL	43.8253	-85.3295	Mutch Harry L
doesn't penetrate		17N-9W-35	21-133-36627-00-00	36627	STATE HERSEY 1-35			Apr-83	INACTIVE	LOCATION	43.8167	-85.3509	Rovsek Aldolph E and Muskegon Development Company
X		17N-9W-35	21-133-36355-00-00	36355	STATE HERSEY 2-35	8310	CINCINNATIAN	Jan-83	INACTIVE	DRY HOLE	43.8203	-85.3604	Marathon Oil Co.
F		17N-9W-35	21-133-38748-00-00	38748	GREIN 1-35	8206	CABOT HEAD	Jun-85	INACTIVE	NATURAL GAS WELL	43.8238	-85.346	Marathon Oil
doesn't penetrate		17N-9W-35	21-133-28888-00-00	28888	RANDOLPH & PAINE & THIEL UNIT 1	1655	MICHIGAN STRAY	Jul-72	INACTIVE	DRY HOLE	43.825	-85.3592	Mutch J O
doesn't penetrate		17N-9W-35	21-133-28786-00-00	28786	GREIN, DONALD & PAINE, HENRY 1	1638	MICHIGAN STRAY	Mar-72	INACTIVE	NATURAL GAS WELL	43.8251	-85.349	Hersey Oil and Gas Co.
R		17N-9W-26	21-133-37519-00-00	37519	MILLER 1-25	8425	CABOT HEAD	Aug-84	INACTIVE	NATURAL GAS WELL	43.8334	-85.3463	Marathon Oil Co.
DD		17N-9W-26	21-133-36942-00-00	36942	WOODWARD ET AL 1-26	8135	CABOT HEAD	Oct-83	INACTIVE	DRY HOLE	43.8346	-85.3568	PPG Oil and Gas Company, Inc.
K		17N-9W-26*	21-133-00378-70-00	378	KALIUM 1042*	8116	A-1 SALT	Feb-85	INACTIVE	PART 625, CLASS III	43.8401	-85.3619	Mosaic USA LLC, DBA Mosaic Potash Hersey, LLC
Y		17N-9W-26*	21-133-366-00-0000	36600	THOMAS 1-26*	8085	CABOT HEAD	Jan-84	INACTIVE	DRY HOLE	43.8418	-85.3611	PPG Oil and Gas Company, Inc.
L		17N-9W-26*	21-133-00379-70-00	379	KALIUM 1052*	8045	A-1 SALT	Mar-85	INACTIVE	PART 625, CLASS III	43.8398	-85.3619	Mosaic USA LLC, DBA Mosaic Potash Hersey, LLC
I		17N-9W-26*	21-133-00394-70-00	394	KALIUM HERSEY 1031*	7973	A-1 SALT	Oct-94	INACTIVE	PART 625, CLASS III	43.8394	-85.3618	Mosaic USA LLC, DBA Mosaic Potash Hersey, LLC
records unavailable		17N-9W-26*	21-133-00448-70-00	448	KALIUM HERSEY 2041*	7941	A-1 SALT	Jun-00	INACTIVE	PART 625, CLASS III	43.8332	-85.3591	Mosaic USA LLC, DBA Mosaic Potash Hersey, LLC
records unavailable		17N-9W-26*	21-133-00348-70-00	348	KALIUM 1011*	7827	A-1 EVAPORITE	Nov-84	INACTIVE	PART 625, CLASS III	43.8405	-85.3615	Mosaic USA LLC, DBA Mosaic Potash Hersey, LLC
records unavailable		17N-9W-26*	21-133-00437-70-00	437	KALIUM HERSEY 2081*	7811	A-1 SALT	7-Jun	INACTIVE	PART 625, CLASS III	43.8327	-85.3592	Mosaic USA LLC, DBA Mosaic Potash Hersey, LLC
J		17N-9W-26*	21-133-00381-70-00	381	KALIUM 1031*	4800	A-1 SALT	Feb-92	INACTIVE	PART 625, CLASS III	43.8396	-85.3619	Mosaic USA LLC, DBA Mosaic Potash Hersey, LLC
doesn't penetrate		17N-9W-26	21-133-28635-00-00	28635	PAINE, HENRY 1	1558	MICHIGAN STRAY	Nov-71	INACTIVE	NATURAL GAS WELL	43.8324	-85.3494	Mutch Harry L
doesn't penetrate		17N-9W-25	21-133-30341-00-00	30341	MILLER, DOUGLAS & THIEL, HAULDAH	1561	BROWN LIMESTONE	Aug-75	INACTIVE	DRY HOLE	43.8319	-85.3392	Mutch Harry L
doesn't penetrate		17N-9W-25	21-133-30384-00-00	30384	JOHNSON, WALT & MILLER, DOUG & THIEL	1529	MICHIGAN STRAY	Aug-75	INACTIVE	DRY HOLE	43.8326	-85.3286	Mutch J O
doesn't penetrate		17N-9W-25	21-133-12066-00-00	12066	JOHNSON-CODY ET AL COMM. 1	1520	MARSHALL	Jan-46	INACTIVE	DRY HOLE	43.8392	-85.3297	Oryx Energy Co. and Carter Oil Co.
doesn't penetrate		17N-8W-32	21-133-27307-00-00	27307	MANEY, NORMAN 1	1660	MARSHALL	Jul-68	INACTIVE	DRY HOLE	43.8223	-85.3049	Consumer Power and Michigan Consolidated Gas
E		17N-8W-31	21-133-34558-00-00	34558	FREUDENBURG 1-31	10858	PRAIRIE DU CHIEN	Jul-81	INACTIVE	DRY HOLE	43.8265	-85.3083	JEM Petroleum Corp.
F		17N-8W-31	21-133-358-00-0000	35800	GRAY 1-31	9769	PRAIRIE DU CHIEN	Aug-82	INACTIVE	NATURAL GAS WELL	43.8275	-85.3224	Marathon Oil Co.
U		17N-8W-31	21-133-36336-00-00	36336	PARK 1-31	8216	CLINTON	Feb-84	INACTIVE	DRY HOLE	43.8203	-85.322	Marathon Oil Co.
E		17N-8W-31	21-133-34558-01-00	34852	FREUDENBURG 1-31A	8183	DUNDEE	Aug-81	INACTIVE	DRY HOLE	43.8265	-85.3083	JEM Petroleum Corp.
doesn't penetrate		17N-8W-31	21-133-31786-00-00	31786	KNAPP, GERALD & PARKS, ROBERT 1-31	1590	MICHIGAN STRAY	Sep-77	INACTIVE	NATURAL GAS WELL	43.818	-85.32	Hersey Oil and Gas Co.
CC		17N-8W-30	21-133-35977-00-00	35977	WARK 1-30	8371	CINCINNATIAN	Sep-82	INACTIVE	DRY HOLE	43.8421	-85.3128	Willmet Inc.
P		17N-8W-30	21-133-33466-00-00	33466	MANEY, NORMAN 1-30	5080	AMHERSTBURG	Feb-80	INACTIVE	DRY HOLE	43.8347	-85.3196	Dart Oil and Gas Co.

APPENDIX TAB LETTER	Review Check	TRS	API Number	Permit Number	Well Name and Number	Total Depth	Formation at Total Depth	Drill Date	Well Status	Well Type	WH_Lat	WH_Long	Operator Name
O		17N-8W-30	21-133-27159-00-00	27159	MADDERN, H 1	4030	DUNDEE	Feb-68	INACTIVE	DRY HOLE	43.8333	-85.3126	Madlou Inc.
AA		17N-8W-19	21-133-38463-00-00	38463	VUKIN UNIT 1-19	8385	CINCINNATIAN	Feb-85	INACTIVE	DRY HOLE	43.844	-85.3148	PPG Oil and Gas Company, Inc. and Amoco Production Co.
AA		17N-8W-19	21-133-38463-70-00	5006	VUKIN UNIT 1-19	8385		Dec-84	INACTIVE	DRY HOLE	43.844	-85.3148	PPG Oil and Gas Company, Inc. and Amoco Production Co.
records unavailable		16N-9W-2*	21-107-37188-00-00	37188	JENSEN 1-2*	8085	CABOT HEAD	Nov-83	INACTIVE	DRY HOLE	43.8073	-85.3455	Marathon Oil Co.
16N-9W-12		16N-9W-12	21-107-00340-70-00	340	PILARSKI 1-12	8318	CINCINNATIAN	Aug-84	INACTIVE	DRY HOLE	43.7974	-85.3266	PPG Industries, Inc.
T		16N-9W-12*	21-107-36283-00-00	36283	PARK 1-12*	8215	CINCINNATIAN	Jan-83	INACTIVE	DRY HOLE	43.798	-85.3409	Willmet Inc.
BB		16N-9W-11	21-107-00339-70-00	339	WARD 1-11*	8121	CINCINNATIAN	Aug-84	INACTIVE	DRY HOLE	43.7901	-85.3466	PPG Industries, Inc.
no data		16N-9W-1	21-107-00377-70-00	377	JOHNSON 2-1	8085	A-1 SALT	Apr-84	INACTIVE	DRY HOLE	43.8098	-85.3291	PPG Industries, Inc.
no data		16N-9W-1	21-107-00337-70-00	337	JOHNSON 3-1	8073	A-1 EVAPORITE	May-84	INACTIVE	DRY HOLE	43.8098	-85.329	PPG Industries, Inc.
W		16N-8W-7	21-107-36187-00-00	36187	STEIN 1-7	8380	CINCINNATIAN	Nov-82	INACTIVE	DRY HOLE	43.7911	-85.312	Willmet Inc.
records unavailable		16N-8W-6	21-107-36067-00-00	36067	JOHNSON ET AL 1-6	8386	CINCINNATIAN	Oct-82	INACTIVE	DRY HOLE	43.8057	-85.322	Marathon Oil Co.
doesn't penetrate		16N-8W-6	21-107-30728-00-00	30728	MCLACHLAN, GEORGE 1-6	1670	MICHIGAN STRAY	May-76	INACTIVE	DRY HOLE	43.8033	-85.3101	Mutch Harry L
doesn't penetrate		16N-8W-6	21-107-30654-00-00	30654	KNAPP, GERALD & JOHNSON, DON 1-6	1610	MICHIGAN STRAY	Dec-75	INACTIVE	NATURAL GAS WELL	43.8109	-85.3198	Mutch Harry L
V		16N-8W-18*	21-107-3689-00-000	36890	STEIN 1-18*	8264	CINCINNATIAN	Aug-83	INACTIVE	DRY HOLE	43.7765	-85.3074	PPG Oil and Gas Company, Inc.

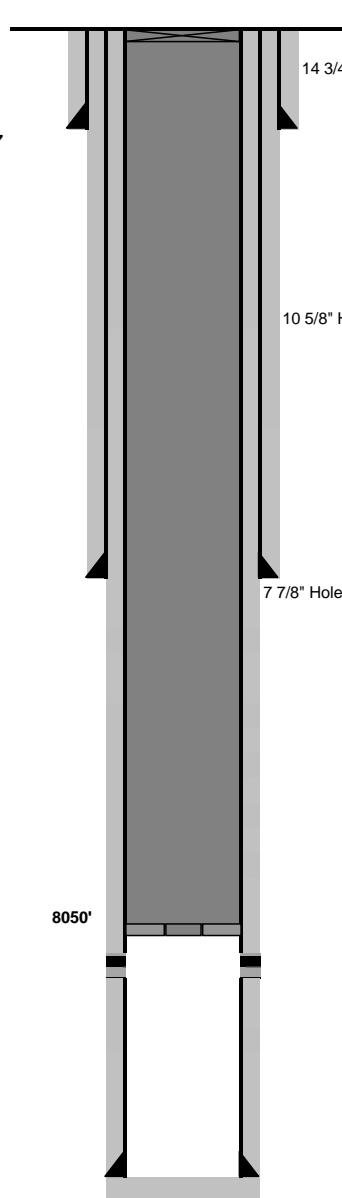






**BABCOCK 1-36**  
**SW NE NE Sec 36 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

API No. 21-133-36068-0000  
GL @ 1108.4'  
KB @ 1125.2'  
WELL COMPLETION DATE: 11-28-83  
PLUGGING COMPLETION DATE: 1-3-87



UPDATED APRIL 2014 BY JLT

1/2" STEEL PLATE

14 3/4" Hole

20" CONDUCTOR DRIVEN TO 119'

**SURFACE CASING**

11 3/4", 60#/ft.

SET @ 893' KB

CMT w/310 SX HLC, 200 SX COMMON

10 5/8" Hole

**INTERMEDIATE CASING**

8 5/8", 32#/ft

SET @ 5407' KB

CMT w/ 330 SX HOWCO LITE, 150 SX CLASS A;

550 SX HOWCO LITE, 100 SX CLASS A.

7 7/8" Hole

**PROD. CASING**

5 1/2", 20 & 17#/ft

SET @ 8200' KB

CMT w/ 300 SX HOWCO LITE, 425 SX REG POZ, 160 SX SPECIAL H

**RETAINER @ 8050' GL**

SQUEEZED 50 SX CLASS A CMT w/ .6% RETARDER THRU RETAINER

CMT TO SURFACE w/ 50/50 POZ CONTAINING 6% GEL (680 SX)

**BURNT BLUFF PERFS:**

8100'-8108' KB

TD @ 8201' KB

**BABCOCK 1-36 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
8/29/1983	SPUD.
9/18/1983	DRILLING COMPLETED. FORMATION AT TD CABOT HEAD. PRODUCING FORMATION(S) BURNT BLUFF
10/27/1983	PERFED (OPEN) 8100'-8108'
11/28/1983	WELL COMPLETED. 20" CONDUCTOR SET AT 119' 11 3/4" SET AT 893'; 310 SX HLC, 200 SX COMMON 8 5/8" SET AT 5407'; 330 SX HOWCO LITE, 150 SX CLASS A; 550 SX HOWCO LITE, 100 SX CLASS A 5 1/2" SET AT 8200'; 300 SX HOWCO LITE; 425 SX REG POZ, 160 SX SPECIAL H; PERFS FROM 8100-8108, 500 GALS 28% HCl ACID, Ret. At 8050', CMT TO SURF, P & A
12/29/1986	PLUGGING START DATE SET RETAINER AT 8050' SQUEEZED 50 SX CLASS A CEMENT CONTAINING .6% RETARDER THROUGH RETAINER CEMENTED TO SURFACE WITH 50/50 POZ CONTAINING 6% GEL (680 SX) CUT OFF CASING AT BASE OF CELLAR 3' BELOW GROUND LEVEL AND CAPPED WITH 1/2" STEEL PLATE
1/3/1987	PLUGGING COMPLETION DATE

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

USE APPROPRIATE BLOCKS. FOR ITEMS NOT LISTED SUBMIT ATTACHMENTS.  
REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☒ ACT 315, P.A. 1969, AS AMENDED

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT  
IN FINES AND/OR IMPRISONMENT.

**RECORD OF WELL:** ☒ PLUGGING

(MAIL THREE COPIES TO THE DISTRICT OFFICE WITHIN 30 DAYS AFTER  
COMPLETION OF PLUGGING OR REWORK)

NAME AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc.  
One Jackson Square, Suite 600  
Jackson, MI 49201

PERMIT NO 36068	TYPE OF WELL
Min. Well 1212-831-367	Gas/P&A
FIELD/FACILITY NAME	
Hersey Evart	
WELL NAME & NUMBER	
Babcock 1-36	
WELL LOCATION	
SW 1/4 of NE 1/4 of NE 1/4 Section 36 T 17N R 9W	
TOWNSHIP	COUNTY
Hersey	Osceola
TOTAL DEPTH	FORMATION
8201' (log)	Burnt Bluff
PLUGGING/REWORK STARTING DATE	PLUGGING/REWORK COMPLETION DATE
12/29/86	01/03/87
TOTAL DEPTH AFTER REWORK	MECHANICAL LOGS RUN
0	N/A
WELL COMPLETED FOR	FORMATION AND ZONE
P & A	

CASING SIZE	WHERE SET	AMOUNT RECOVERED	SHOT OR RIPPED	TYPE OF BRIDGES OR PLUGS	DEPTH PLACED	SACKS OF CEMENT & ADDITIVES
20" Conductor	119'	None	N/A			
11-3/4"	893'	None	N/A			
8-5/8"	5407'	None	N/A			
5-1/2"	8200'	None	N/A	5-1/2" Retainer	8050'	50 sx Class A thru retainer, filled

WERE TOOLS, TUBING, CASING, ETC. LOST OR LEFT IN THE HOLE BEFORE OR  
AFTER PLUGGING? IF YES, GIVE DETAILS

See Above Casing Record

DID A SERVICE COMPANY PUMP MUD, SPOT CEMENT,  
IF YES, GIVE NAME AND ADDRESS.

Halliburton Services  
P.O. Box 519  
Kalkaska, MI 49646

WELL PLUGGING/REWORK CONTRACTOR AND ADDRESS

Well Tech. Inc.  
2255 Parkway  
Mt. Pleasant, MI 48858

PERMITEE'S PLUGGING WITNESS

Timothy L. Baker

NAME(S) OF DNR REPRESENTATIVE WHO

Jack Snider

☒ ISSUED PERMIT

☐ WITNESSED PLUGGING

**WELL CASING RECORD — BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture	Perforations
Size	Depth	Sacks	Type	From	To	Treatment Record	If plugged, how?
20" Con	119'	Driven					
11-3/4"	893'	310 sx HLC, 200 sx	Common				
8-5/8"	5407'	330 sx Howco Lite, 150 sx	Class A				
		550 sx Howco lite, 100 sx	Class A				
5-1/2"	8200'	300 sx Howco lite, 8100 - 8108				500 gals 28% HCl acid	Ret. @ 8050', cmt
		425 sx Reg Poz, 160 sx Special H					to surf, P & A.
Casing		Cement		Perforations		Acid or Fracture	Perforations
Size	Depth	Sacks	Type	From	To	Treatment Record	If plugged, how?

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED OR REWORKED.

1. Set retainer @ 8050'.
2. Squeezed 50 sx Class A cement containing .6% retarder through retainer.
3. Cemented to surface with 50/50 POZ containing 6% gel (680 sx).
4. Cut off casing at base of cellar 8" below ground level and capped with 1/2" steel plate.



[illegible]

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30033  
LANSING, MICHIGAN 48909

1212-831-367

REQUIRED BY AUTHORITY OF:

☒ ACT 315, P.A. 1969, AS AMENDED ☒ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☐ CHANGE WELL STATUS

☒ PLUG AND ABANDON

NON-REVISION AND OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ADDSIZE (315 ONLY)

☐ FRACTURE (315 ONLY)

LAST PRODUCTION, INJECTION AND TYPE OF FLUID  
(Amount of oil & gas production)

30 Mcf/month

FIELD/FACILITY NAME

Hersey Clinton Pool

WELL NAME

Babcock

WELL NO.

1-36

WELL LOCATION

SW 1/4 of NE 1/4 of NE 1/4 Section 36 T 17N R9W

TOWNSHIP

Hersey

COUNTY

Osceola

DATE DRILLING COMPLETED

9/18/83

DATE LAST PRODUCED/UTILIZED

6/84

WORK TO BE DONE BY: ☒ APPROVAL MAILED

will notify

STARTING DATE

12/29/86

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
20"		119	DP		
113/4"		893	510	circled	8100-8108
85/8"		5407	1130	"	
54"		8200	885	3300	

FORMATION RECORD (Formation and depth of oil, gas and water shows, etc.):

KB 1125.2

BOD 598

STRAY 1550 SJ

TL 3284

DD 3802

RCD 3940

BI 5382

BS 6584

NIA 7904

Clinton 8024

Burnt Bluff 8096

Cabothead 8158

TD 8201

DETAIL PROPOSED PROCEDURES:

Set 5 1/2" cmt. ret. 8050'. Squeeze 50 sx thru perfs. Close retnr.  
Spot cmt. w/50-50 poz from top retnr. to surf. in stages as tubg. is pulled.  
All csg. to be abandoned w/well. Cut 3' below grade and cap w/cmt. & welded  
1/2" steel plate.

OF ADDITIONAL REQUIREMENTS:

NAME SIGNATURE (Authorized Representative)

DATE

APPROVED BY:

OFFICE

Cadillac

APPROVAL DATE

12/23/86

TERMINATION DATE

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-3) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.

# CADILLAC HAS COPY

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

USE APPROPRIATE BLOCKS FOR ITEMS NOT LISTED. SUBMIT ATTACHMENTS  
REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☒ ACT 315, P.A. 1969, AS AMENDED

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT  
IN FINES AND/OR IMPRISONMENT.

## RECORD OF WELL: ☒ PLUGGING

(MAIL THREE COPIES TO THE DISTRICT OFFICE WITHIN 30 DAYS AFTER  
COMPLETION OF PLUGGING OR REWORK)

NAME AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc.  
One Jackson Square, Suite 600  
Jackson, MI 49201

PERMIT NO 36068

Min. Well 1212-831-367

TYPE OF WELL

Gas/P&A

FIELD/FACILITY NAME

Hersey Evart

WELL NAME & NUMBER

Babcock 1-36

WELL LOCATION

SW 1/4 of NE 1/4 of NE 1/4 Section 36 T 17N R 9W

TOWNSHIP

Hersey

COUNTY

Osceola

TOTAL DEPTH

8201' (Log)

FORMATION

Burnt Bluff

PLUGGING/REWORK STARTING DATE

12/29/86

PLUGGING/REWORK COMPLETION DATE

01/03/87

TOTAL DEPTH AFTER REWORK 0

Abandoned Well

MECHANICAL LOGS RUN

N/A

WELL COMPLETED FOR

P & A

FORMATION AND ZONE

CASING SIZE	WHERE SET	AMOUNT RECOVERED	SHOT OR RIPPED	TYPE OF BRIDGES OR PLUGS	DEPTH PLACED	SACKS OF CEMENT & ADDITIVES
20" Conductor	119'	None	N/A			
11-3/4"	893'	None	N/A			
8-5/8"	5407'	None	N/A			
5-1/2"	8200'	None	N/A	5-1/2" Retainer	8050'	50 sx Class A thru retainer, filled hole w/680 sx 50/5

WERE TOOLS, TUBING, CASING, ETC. LOST OR LEFT IN THE HOLE BEFORE OR  
AFTER PLUGGING? IF YES, GIVE DETAILS.

See Above Casing Record

DID A SERVICE COMPANY PUMP MUD, SPOT CEMENT, POZ w/6% gel.  
IF YES, GIVE NAME AND ADDRESS.

Halliburton Services  
P.O. Box 519  
Kalkaska, MI 49646

WELL PLUGGING/REWORK CONTRACTOR AND ADDRESS

Well Tech. Inc.  
2255 Parkway  
Mt. Pleasant, MI 48858

PERMITEE'S PLUGGING WITNESS

Timothy L. Baker

NAME(S) OF DNR REPRESENTATIVE WHO

Jack Snider

☒ ISSUED PERMIT

☐ WITNESSED PLUGGING

## WELL CASING RECORD — BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
20" Con	119'	Driven					
11-3/4"	893'	310 sx HLC, 200 sx Common					
8-5/8"	5407'	330 sx Howco Lite, 150 sx Class A					
		550 sx Howco lite, 100 sx Class A					
5-1/2"	8200'	300 sx Howco lite, 8100 - 8108				500 gals 28% HCl acid	Ret. @ 8050', cmt to surf, P & A.
		425 sx Reg Poz, 160 sx Special H					
Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED OR REWORKED

1. Set retainer @ 8050'.
2. Squeezed 50 sx Class A cement containing .6% retarder through retainer.
3. Cemented to surface with 50/50 POZ containing 6% gel (680 sx).
4. Cut off casing at base of cellar 8" below ground level and capped with 1/2" steel plate.





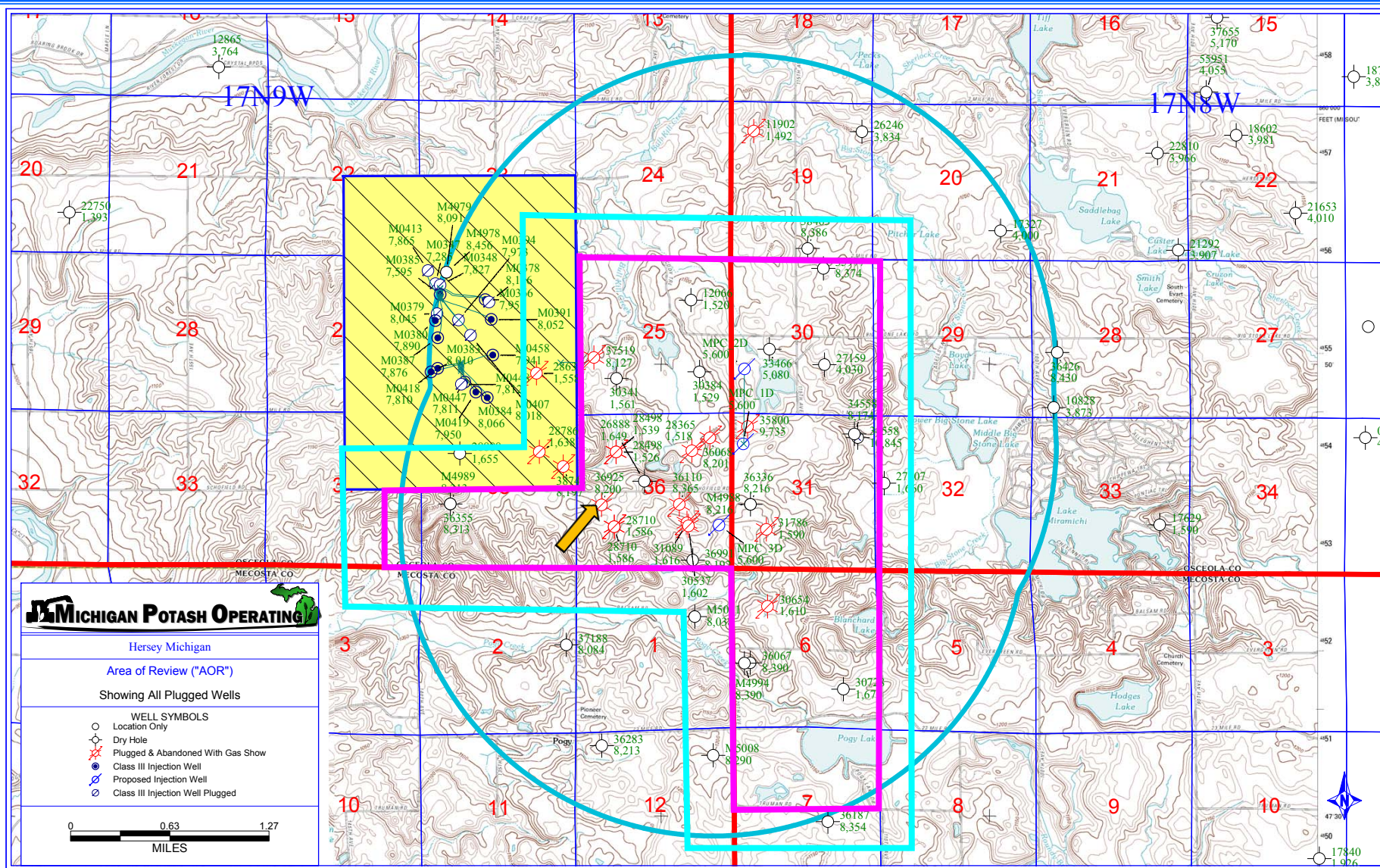


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**BALDINO 1-36**  
NE NW SW Sec 36 T17N R9W  
OSCEOLA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

1/2" STEEL PLATE

50'-SURFACE 15 SX CLASS A CMT

API No. 21-133-36925-0000

GL @ 1166.6'

KB @ 1183.2'

WELL COMPLETION DATE: 11-17-83

PLUGGING COMPLETION DATE: 8-17-95

975'-800' 50 SX CLASS A CMT

2900'-2725' 50 SX CLASS A CMT

8 5/8" CIBP @ 2900'

7100'-6889' 25 SX CLASS H CMT

5 1/2" CMT RETAINER @ 8020' KB

SQUEEZED 25 SX CLASS H CMT THRU RETAINER,  
LEFT 25 SX ON TOP OF RETAINER  
TOC @ 7809'

UPDATED APRIL 2014 BY JLT

24" CONDUCTOR DRIVEN TO 100'

14 3/4" Hole

**SURFACE CASING**

11 3/4", 60#/ft.

SET @ 954' Sch

CMT w/ 350 SX HOWCO LITE + 200 SX CLASS A w/3% CaCl2

TOC @ SURFACE

10 5/8" Hole

**INTERMEDIATE CASING**

8 5/8", 32#/ft

SET @ 5465' Sch

1st STAGE: 360 SX HOWCO LITE w/2% CC + 200 SC CALSS A DV TOOL 23812'

2nd STAGE: 810 SX HOWCO LITE w/2% CC + 100 SX CLASS A w/3%CC

TOC @ SURFACE

7 7/8" Hole

**PROD. CASING**

5 1/2", 20 & 17#/ft

SET @ 8190' KB

300 SX HOWCO LITE w/18% SALT + 400 SX REGULAR

POX w/18% SALT + 150 SX CLASS H CMT

TOC @ 3500 EST.

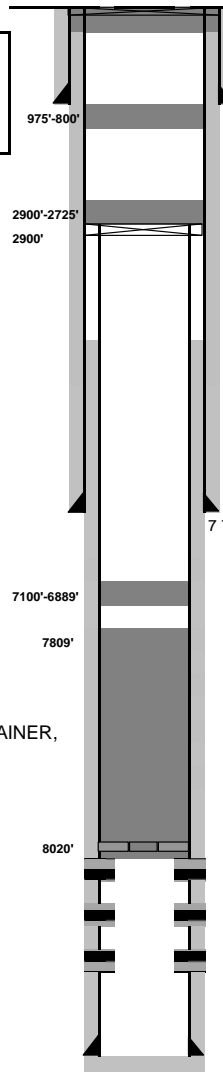
CMT @ 2900'

**BURNT BLUFF PERFS:**

8086'-8089' KB

8094'-8102' KB

8108'-8112' KB



TD @ 8190' KB



### BALDINO 1-36 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
8/17/1983	SPUD.
9/10/1983	DRILLING COMPLETED. FORMATION AT TD CABOT HEAD. PRODUCING FORMATION(S) BURNT BLUFF
11/16/1983	PERFED (OPEN) 8086'-8089, 8094'-8102', 8108'-8112'
11/17/1983	WELL COMPLETED. 24" CONDUCTOR SET AT 100' 11 3/4" SET AT 953'; 350 SX HOWCO LITE + 200 SX CLASS A w/3% CaCl2 8 5/8" SET AT 5465'; FIRST STAGE: 360 SX HOWCO LITE w/2% CC + 200 SX CLASS A DV TOOL @ 3812' SECOND STAGE: 810 SX HOWCO LITE w/2% CC + 100 SX CLASS A w/3%CC 5 1/2" SET AT 8190'; 300 SX HOWCO LITE W/18% SALT + 400 SX REGULAR POX w/18% SALT + 150 SX CLASS H CMT
8/15/1995	PLUGGING START DATE
8/15/1995	5 1/2" CMT RETAINER SET AT 8020'.
8/16/1995	STING INTO RETAINER AT 8020' FOR INJECTION TEST, HALLIBURTON MIXED 50 SX CLASS H CMT, STUNG INTO RETAINER AND DISPLACE 25 SX THRU RETAINER, PULL OUT AND LEAVE 25 SX ON TOP OF RETAINER. TOO H WITH TUBING TO 7100' AND SPONT 25 SX CLASS H CMT PLUG. TOO H WITH TUBING. ND BOP'S AND HEAD. RU ENTERRA OILFIELD TOOLS AND CUT 5 1/2" CASING BELOW SLIPS. PULL STUB AND SLIPS FROM CASING HEAD. NU HEAD AND BOP'S. RU HALLIBURTON WIRELINE, SPEAR CASING AND FREEPOINT 5 1/2" CASING @2900'. TOO H WITH FREEPOINT TOOL. INSTALL CUTTER. TIH AND CUT CASING @ 2900'. LAY DOWN STUB AND SPEAR. SD FOR NIGHT.
8/17/1995	TOOH LAYING DOWN 5 1/2" CASING. TIH WITH 2100' OF TUBING AND TOH LAYING DOWN. NU BOPS/S AND TUBING HEAD, INSTALL 8 5/8" CAST IRON BRIDGE PLUG ON TUBING AND TIH TO 2900', SET BRIDGE PLUG. RU HALLITBURTON. STING OUT OF BP AND SPOT A 50 SX CLASS A CEMENT PLULG ON TOP OF RETAINER. LAY DONW 250' OF TUBING AND PUMP 120 BBLs OF MUD FROM GREIN LOCATION DOWN HOLE. TOO H LAYING DOWN TUBING TO 975' WHERE A 50 SX CLASS A CEMENT PLUG WAS SPOTTED, THEN TOO H LAYING DOWN TUBING. REMOBE BOP'S AND TUBING HEAD, PUMP 15 SX CEMENT AT SURFACE AND FILL TOP 50'. RD HALLIBURTON. CUT OFF 11 3/4" HEAD IN BASE OF CELLAR AND CAP WITH A 1/2" STEEL PLATE WELL NUMBER 1-36 AND DATE 8-16-95 WERE MARKED ON TOP. RD COMPLETION UNIT. SD FOR NIGHT.
8/17/1995	PLUGGING COMPLETED.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in DUPLICATE Within 30 Days after Well Completion

DEC 02 1983

PERMIT NUMBER

36925

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG Oil & Gas Co., Inc. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Baldino #1-36						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE NW SW		SECTION 36	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 460 Ft. from North		FOOTAGES (East/West) 840 Ft. from West		COUNTY NAME Osceola			
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		FOOTAGES (East/West)		COUNTY NAME			
DATE	DRILLING BEGUN 8-17-83		TOTAL DEPTH OF WELL Driller 8200 Log 8190		TYPE WELL Gas Well		ELEVATIONS
	DRILLING COMPLETED 9-10-83		FORMATION AT T.D. Cabot Head		FT. DRLD. -- ROTARY TOOLS From 0 To 8190		
	WELL COMPLETED 11-17-83		PRODUCING FORMATION(S) Burnt Bluff		FT. DRLD. -- CABLE TOOLS From To		
					K.B. 1183.2	R.F. 1181.9	
					R.T.	Grd. 1166.6	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
24"	100	D.P.					YES	NO
11 3/4"	954 Sch	550 sx		11-16-83	1x/ft	8086-8089	X	
8 5/8"	5476 Sch	1470 sx			1x/ft	8094-8102	X	
5 1/2"	8190	950 sx			1x/ft	8108-8112	X	

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
Burnt Bluff	Gas	8090	8126				Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Traverse	Gas	3620					XX	
				Reed City Dol	Gas	4065					XX	
				Richfield	Gas	4810					XX	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
11-17-83	8086-8112	2000 gal. 20%					
			None				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION

DEVIATION SURVEY

PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT CNL GR	200-8190			2750	1/2°			
Birdwell		Sonic	200-8190			4300	1°			
OTHER		DLL-MLL	2500-8190			6600	1°			
						7900	1/2°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
			1,450			

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 11-9-83	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E. Booker</i>
-----------------	--	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☐ CHANGE WELL STATUS ☒ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION/INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

10 MCFD

WORK TO BE DONE BY: ☐ APPROVAL MAILED

To Be Determined

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
	20"	100'	Driven	N/A	
14 3/4"	11 3/4", 60#	953'	350 sx Howco lite + 200 sx Class "A" w/3% CaCl2	Surface	
10 5/8"	8 5/8", 32#	5465'	*	Surface	
7 7/8"	5 1/2", 20 & 17#	8190'	**	3500 est.	8086-89'

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

8094-8102'

8108-8112'

- \* 1st stage: 360 sx Howco lite w/2% cc + 200 sx Class "A" DV tool @3812'.
- 2nd stage: 810 sx Howco lite w/2% cc + 100 sx Class "A" w/3% cc.
- \*\* 300 sx Howco Lite w/18% salt + 400 sx regular Pox w/18% salt + 150 sx Class "H" cement.

See Exhibit "A"

DETAIL PROPOSED PROCEDURES:

**GEOLOGICAL SURVEY**

See Attachment

**MAR 08 1994**

**Permits & Bonding Unit**

DNR ADDITIONAL REQUIREMENTS:

NAME/SIGNATURE (Authorized Representative)

W.R. Daniels, Jr. Michigan Production Superintendent

APPROVED BY DNR

OFFICE

APPROVAL DATE

DATE

TERMINATION DATE

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.





Permit Number  
36925

Well Name & Number  
BALDINO #1-36

5 1995

## RECORD OF WELL PLUGGING OR REWORK

REQUIRED BY AUTHORITY OF: ACT 61, PA 1939, as amended or ACT 315, PA 1969, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Type of Well Gas

Field Name Hersey Unit

1/4 1/4 1/4, Section, Township, Range, County  
NE NW SW, Section 36-T17N-R9W, Osceola Co., MI

Date Plugging / Rework Started  
8-15-95

Date Plugging / Rework Completed  
8-17-95

Name and Address of Well OWNER  
MARATHON OIL COMPANY  
4445 E. MOSHERVILLE ROAD  
JONESVILLE, MI 49250

Name and Address of Contractor/Service Company  
(attach additional sheets as needed)  
McConnell & Scully, 133 W. Main St. Homer, MI 49245  
Halliburton Service, PO Box 374, Mt. Pleasant, MI 48804

Indicate Operation & Type of Well Permit  
☐ PLUGGING ☐ REWORK ☐ Act 61 Oil & Gas ☐ Act 315 Mineral Wells

Name of DNR employee issuing Plugging Permit or Approving Change of Well Status  
Michael J. Moss  
Date Issued 3-3-94

☐ Tools, tubing, etc. left in hole - describe in Daily Chronology.

☐ Well logs run - list types and depths in Daily Chronology.

### For WELL PLUGGING Only (HOLE CONDITIONS AFTER PLUGGING)

CASING			
Casing Size	Where Set	Amount Casing Pulled	Depth Casing Cut/Perfed: Windows Milled
20"	100'	4'	4'
11-3/4"	953'	4'	4'
8-5/8"	5465'	4'	4'
5-1/2"	8190'	2900'	2900'

PLUGS				
Depth		Type of Bridge or Plug	Cement Plugs: Cement type, # sx, and additives	Tagged Top? Y/N
Bottom	Top			
8020	8020	Cement Retainer		Y
8020	7809	Cement	25 sx Class H	
7100	6889	Cement	25 sx Class H	
2900	2900	Cast Iron BP		Y
2900	2725	Cement	50 sx Class "A"	
975	800	Cement	50 sx Class "A"	
50	Surf	Cement	15 sx Class "A"	

Check ☐ if NORM material was reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on back of this form.

### For WELL REWORK Only

REWORK WAS TO: ☐ TEMPORARILY ABANDON  
☐ CONVERT TO: ☐ Disposal Well ☐ Production ☐ Storage ☐ Enhanced Recovery ☐ Other  
☐ REMEDIAL: ☐ Perf & Test ☐ Repair Casing/Cement ☐ Redrill ☐ Other  
☐ PLUGBACK: ☐ New Production Zone ☐ Disposal ☐ Storage ☐ Enhanced Recovery ☐ Other

### Well Casing Record - BEFORE Rework

Casing		Cement		Perforations			Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well Casing Record - AFTER Rework (indicate additions and changes only; complete Test Record on next page)

Casing		Cement		Perforations			Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### BEFORE REWORK

### AFTER REWORK

Total Depth	Formation/Zone	Well Completed For	Total Depth	Formation/Zone	Well Completed For



DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
August 16, 1995

WORKOVER/RECOMPLETION

Hersey Unit  
Baldino 1-36  
Osceola County, MI  
AFE NO:  
AFE AMOUNT:

OPERATOR: Marathon Oil  
RIG: McConnell & Scully  
MOC/WI:  
MIRU: 08/14/95

---

COST TO DATE: \$

DAY: 1

PRESENT OPERATION: Prepare to set bottom plugs.

REMARKS: 08/15/95: Finish RU completion rig, RU Halliburton, pump 50 bbls brine down tubing to kill well. ND tree and flowline. NU BOP's. Release and equalize packer and TOOH. Wait on Halliburton Wireline. RU Halliburton Wireline, TIH w/gauge ring to 8080' - some debris in last 50', TOOH w/gauge ring, TIH w/5-1/2" cement retainer and set at 8020'. TOOH. RD Wireline. Install stinger on one joint of tubing. Shut in BOP's. SD for night.

---

COST TO DATE: \$

DAY: 2

PRESENT OPERATION: Laying down 5-1/2" casing.

REMARKS: 08/16/95: TIH with tubing and stinger. Sting into retainer at 8020' for injection test, Halliburton mixed 50 sx Class H cement, stung into retainer and displace 25 sx thru retainer, pull out and leave 25 sx on top of retainer. TOOH with tubing to 7100' and spot a 25 sx Class H cement plug. TOOH with tubing. ND BOP's and head. RU Enterra Oilfield Tools and cut 5-1/2" casing below slips. Pull stub and slips from casing head (slips were tight). NU head and BOP's. RU Halliburton Wireline, spear casing and freepoint 5-1/2" casing @ 2900'. TOOH with freepoint tool. Install cutter. TIH and cut casing @ 2900'. Lay down stub and spear. SD for night.

---

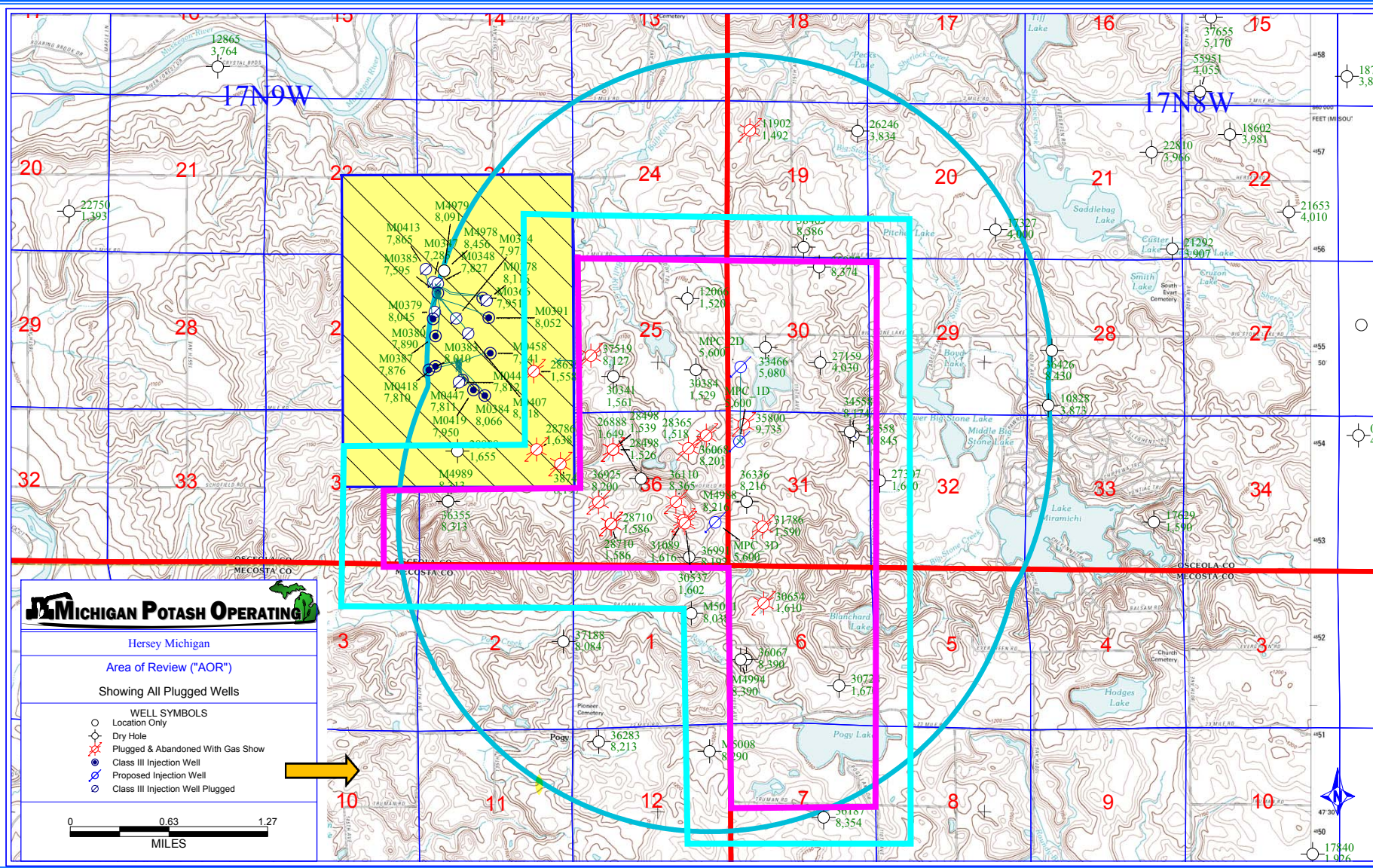
COST TO DATE:

DAY: 3

PRESENT OPERATION: Plugging complete - ready for clean-up.

REMARKS: 08/17/95: TOOH laying down 5-1/2" casing. TIH w/2100' of tubing and TOH laying down. NU BOP's and tubing head, install 8-5/8" cast iron bridge plug on tubing and TIH to 2900', set bridge plug. RU Halliburton. Sting out of BP and spot a 50 sx Class A cement plug on top of retainer. Lay down 250' of tubing and pump 120 bbls of mud from Grein location down hole. TOOH laying down tubing to 975' where a 50 sx Class A cement plug was spotted, then TOOH laying down tubing. Remove BOP's and tubing head, pump 15 sx cement at surface and fill top 50'. RD Halliburton. Cut off 11-3/4" head in base of cellar and cap with a 1/2" steel plate well number 1-36 and date 8-16-95 were marked in top. RD completion unit. SD for night.

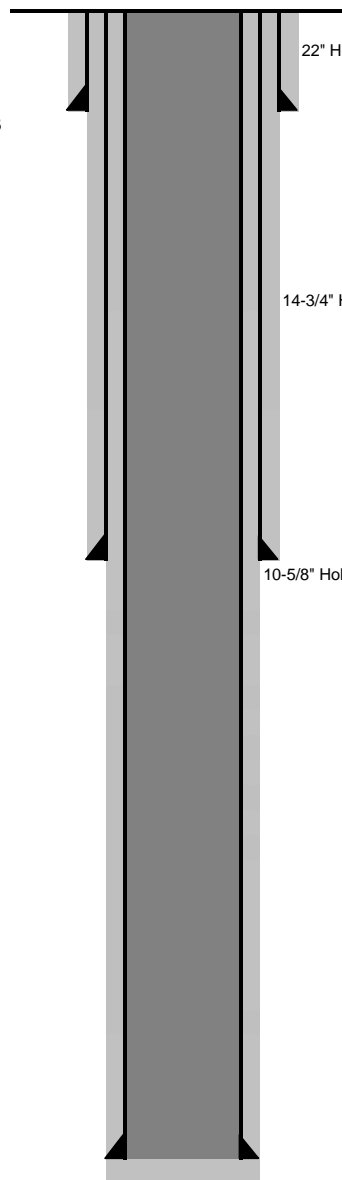






**BOYD 1-10**  
**NW NE NW Sec 10 T16N R9W**  
**MECOSTA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

API No. 21-107-36455-0000  
GL @ 1043'  
KB @ 1059'  
WELL COMPLETION DATE: NA  
PLUGGING COMPLETION DATE: 6/2/83



UPDATED APRIL 3rd 2014 BY JLT  
24" CONDUCTOR DRIVEN TO 82'

22" Hole expected

**SURFACE CASING**

16"; 65#/ft.

SET @ 550' KB

CMT W/410 SX POZ/200 SX CL A TO SURFACE

14-3/4" Hole expected

**INTERMEDIATE CASING**

11 3/4"; 60#/ft.

SET @ 798' KB

CMT W/ 400 SX TO SURFACE

10-5/8" Hole expected

**PROD. CASING**

8 5/8"; 32#/ft.

SET @ 5220' KB

2 STAGES:

#1: 720 SX

#2: 850 SX

CMT TO SURFACE

PLUGGED W/CMT FROM TD TO SURFACE.

TD @ 7975' KB

### BABCOCK 1-36 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
5/2/1983	SPUD.
5/31/1983	DRILLING COMPLETED. FORMATION AT TD CINCINNATIAN. 24" CONDUCTOR SET AT 82' 16" SET AT 550'; 410 SX POZ/200 SX CL A 11 3/4" SET AT 798'; 400 SX 8 5/8" SET AT 5220'; 2 STAGES: #1 720 SX, #2 850 SX
5/31/1983	PLUGGING START DATE RUN DRILL PIPE OPEN ENDED TO 7975' AND SET 115 SX CL A TO 7573' PULLED DRILL PIPE TO 7573' AND SET 185 SX HOWCO LITE TO 6500' PULLED DRILL PIPE TO 6500' AND SPOTTED 185 SX HOWCO LITE TO 5420' PULLED DRILL PIPE TO 5420' AND SPOTTED 115 SX CL A TO 5020' PULLED DRILL PIPE TO 5020' AND SPOTTED 402 SX HOWCO KITE TO 2710' PULLED DRILL PIPE TO 2710' AND SPOTTED 401 SX HOWCO LITE TO 400' PULLED DRILL PIPE TO 400' AND SPOTTED 116 SX TO SURFACE.
6/2/1983	PLUGGING COMPLETION DATE

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

JUN 29 1983

PERMIT NUMBER

36455

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT

Willmet, Inc.  
2250 Enterprise Drive  
Mt. Pleasant, MI 48858

NAME & ADDRESS OF DRILLING CONTRACTOR(S)

James Bigard Drilling Company  
1315 S. Mission  
Mt. Pleasant, MI 48858

LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT

Boyd 1-10

DIRECTIONALLY DRILLED

YES ☐ NO ☒

SURFACE LOCATION

NW NE NW

SECTION

10

TOWNSHIP

16N

RANGE

9W

TOWNSHIP NAME

Grant

FOOTAGES

(North/South)

330

North

Line and 808

(East/West)

East

Line of quarter section

COUNTY NAME

Mecosta

SUBSURFACE LOCATION

SECTION

TOWNSHIP

RANGE

TOWNSHIP NAME

FOOTAGES

(North/South)

(East/West)

COUNTY NAME

DRILLING BEGUN

5-2-83

TOTAL DEPTH OF WELL

Driller 7975 Log 7968

TYPE WELL

Dry Hole

ELEVATIONS

DRILLING COMPLETED

5-31-83

FORMATION AT T.D.

Cincinnatian

FT. DRLD. - ROTARY TOOLS

From 0 To 7975

K.B.

1059

R.F.

1058

WELL COMPLETED

PRODUCING FORMATION(S)

FT. DRLD. - CABLE TOOLS

From To

R.T.

Grd.

1043

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
							YES	NO
24"	82'	D.P.						
16"	550'	410 Sx Poz/200	C1 A					
11 3/4"	798'	400 Sx				NONE		
8 5/8"	5220'	2 Stages: #1 720 Sx						
		#2 850 Sx						

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
NONE				Reed City	Gas	3850					X	
				Sour Zone	Gas	4450					X	
				A2 Carb	Gas	6750					X	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	NONE		NONE				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION

DEVIATION SURVEY

PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	XX	LDT-CNL-GR	600-7975			1750	1°		X	
Birdwell		Sonic	200-7975			4650	1°		X	
						6100	2°		X	
						7720	3°		X	

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
6/14/83	William E. Booker, Geologist	William E. Booker

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

*FINAL APPROVAL*

JUN 29 1983

LANSING HAS COPY

OCT 06 1983

SEP 23 1983

PERMIT NUMBER 36455
FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER Willmet, Inc, 2250 Enterprise Drive, Mt. Pleasant, Michigan 48858		
COMPLETE LEASE OR FARM NAME(S) Boyd		WELL NUMBER 1-10
WELL LOCATION NW ¼ NE ¼ NW ¼ SEC. 10 T. 16N R. 9W	TOWNSHIP Grant	COUNTY Mecosta
TYPE OF WELL (Oil, Gas, Dry Hole, etc.) Dry Hole	TOTAL DEPTH 7975	FORMATION Cincinnati
DATE PLUGGING STARTED 5-31-83	DATE PLUGGING COMPLETED 6-2-83	DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING Skipper

CASING RECORD			
SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	82'		
16"	550'		
11 3/4"	798'		
8 5/8"	5220		

BRIDGES OR PLUGS		
TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	7975	115 Sx C1 A
Cement	7573	185 Sx Howco Lite
Cement	6500	185 Sx Howco Lite
Cement	5420	115 Sx C1 A
Cement	5020	402 Sx Howco Lite
Cement	2710	401 Sx Howco Lite
Cement	400	116 Sx C1 A

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, give details:
Did a Service Company pump mud, spot cement, or set bridge plugs?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	If yes, give name and address: Halliburton
Was the well plugged by a Company or Contractor other than Owner or Operator?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, give name and address:
Representatives of Owner, Operator, Company, or Contractor who witnessed plugging: Marvin Woods		

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED Run drill pipe open ended to 7975 and set 115 sx C1 A to 7573 pulled drill pipe to 7573 and set 185 sx Howco Lite to 6500, pulled drill pipe to 6500 and spotted 185 sx Howco Lite to 5420, pulled drill pipe to 5420 and spotted 115 sx C1 A to 5020, pulled drill pipe to 5020 and spotted 402 sx Howco Lite to 2710, pulled drill pipe to 2710 and spotted 401 sx Howco Lite to 400, pulled drill pipe to 400 and spotted 116 sx to surface.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION		
"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."		
NAME AND TITLE (Typed or Printed) William E. Booker, Geologist	COMPANY NAME AND ADDRESS Strickler Geological Services, Inc. 1425 S. Mission Mt. Pleasant, MI 48858	DATE (Month, Day, Year) 6/14/83
SIGNATURE <i>William E. Booker</i>		



## OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

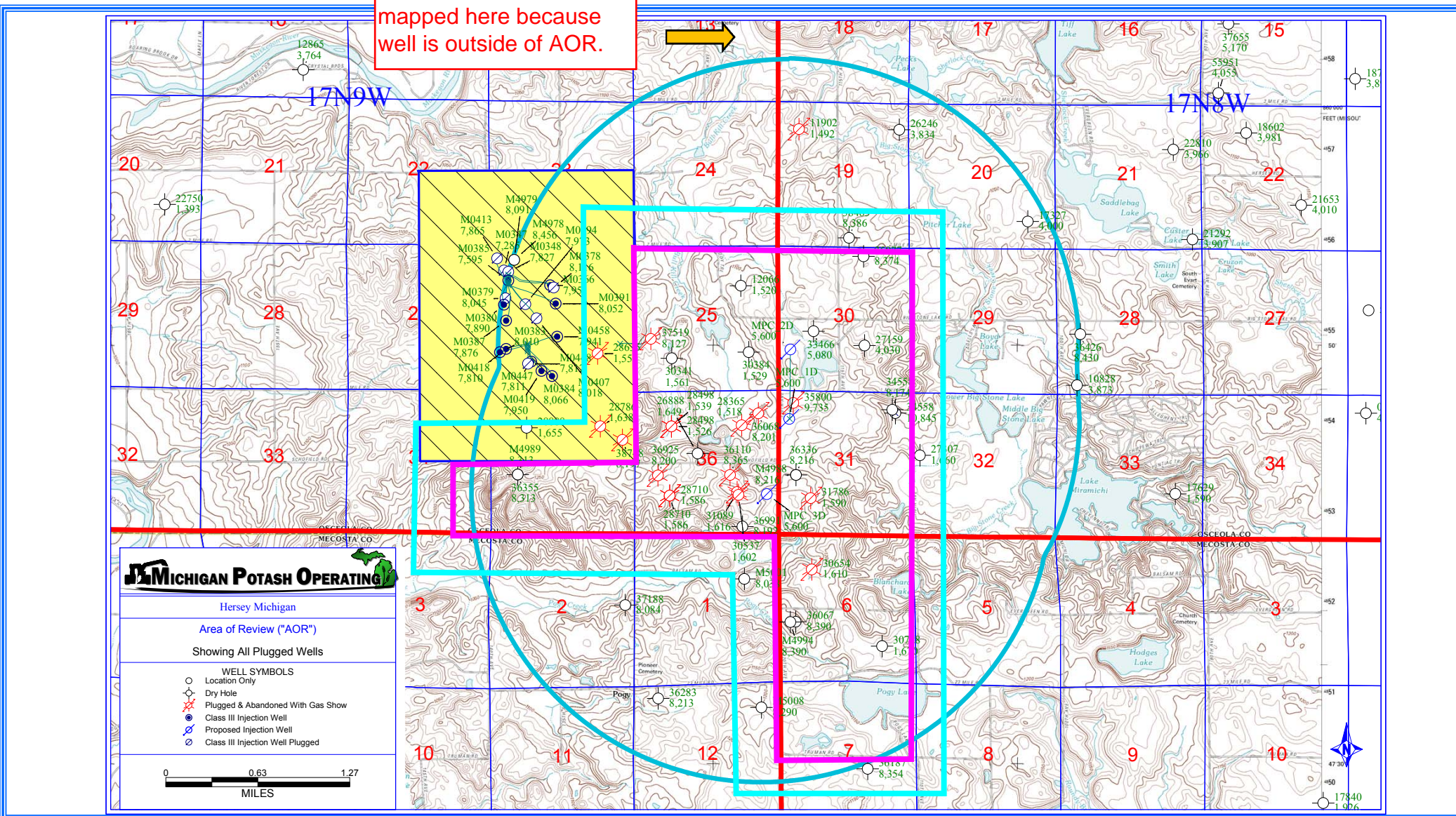
## DEPARTMENT USE ONLY

**Supplemental Plugging Data and Site Conditions:**

9/25/54 Loc OK, re contained and planted.

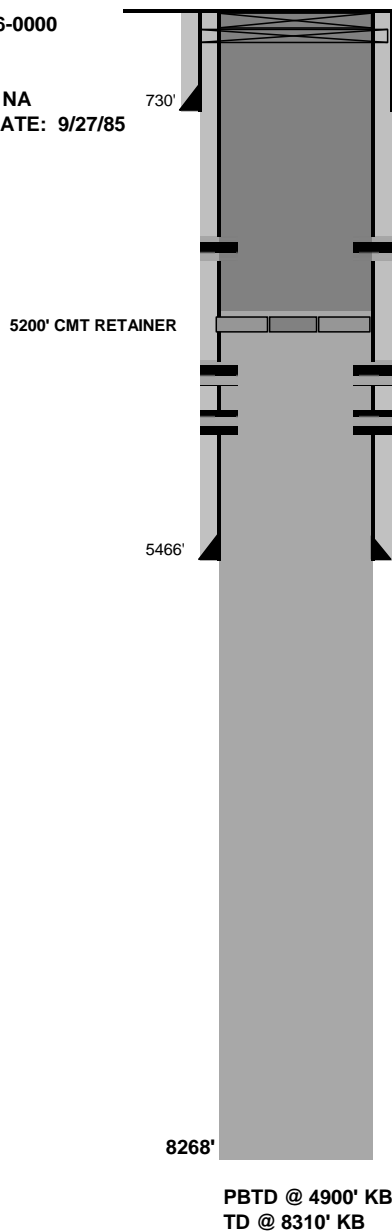
FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES		
SIGNATURE	DIVISION	DATE
<i>John R. Hunt</i>	<i>Geol. Survey</i>	<i>4/28/54</i>

Location is correct. Not mapped here because well is outside of AOR.



**COMPTON 1-13**  
**SW SE NE Sec 13 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

API No. 21-133-36506-0000  
GL @ 1027.4'  
KB @ 1043.9'  
WELL COMPLETION DATE: NA  
PLUGGING COMPLETION DATE: 9/27/85



UPDATED APRIL 2014 BY JLT  
1/4" STEEL PLATE AND 1/2" STEEL PLATE

15" Hole expected  
24" CONDUCTOR DRIVEN TO 100'

**SURFACE CASING**  
13 3/8", 48#/ft  
SET @ 730' KB  
CMT w/800 SX TO SURFACE

13-1/4" Hole expected  
DUNDEE @ 3758' Sch  
**DUNDEE PERFS:**  
3815'-3910'; 4 SHOTS PER FT.

BOIS BLANC @ 5184' Sch  
**BOIS BLANC PERFS:**  
5220'-5262'; 4 HOLES PER FT.  
5324'-5355':

**PLUGBACK AND CONVERT TO BRINE DISPOSAL**  
CMT w/ 200 SX @ 8310', 550 SX @ 7838',  
175 SX @ 5715' AND 100 SX BRIDGE PLUG @ 5200'.  
**9-5/8" CMT RETAINER @ 5200' KB**  
SQUEEZED 50 SX CLASS A CMT THRU RETAINER

**INTERMEDIATE CASING**  
9 5/8", 40#/ft  
SET @ 5466' KB  
CMT w/1370 SX  
TOC @ +/- 210' KB

**SPOT 2200' CU FT. CMT. ABOVE RETAINER AT 5200' FOR FILL UP.**  
**CUT CSG 3' BELOW GRD LEVEL AND**  
**CAP W/CMT. & STEEL PLATES.**

CINCINNATIAN @ 8268' Sch

### COMPTON 1-13 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
2/26/1983	SPUD.
3/26/1983	DRILLING COMPLETED. FORMATION AT TD CINCINNATIAN. TD 8310' 24" CONDUCTOR SET AT 100' 13 3/8" SET AT 730'; 800 SX 9 5/8" SET AT 5466'; 1370 SX
4/12/1983	REWORK COMMENCED
3/29/1983	TRIPPED IN HOLE OPEN ENDED AND SPOTTED 200 SX CLASS A AT 8310', SPOTTED 550 SX POZ AT 7838', SPOTTED 175 SX CLASS A AT 5715'.
4/12/1983	RIGGED UP.
4/13/1983	DISPLACED HOLE WITH FW - PERFED 5324-5355.
4/14/1983	SPOTTED 1,000 GAL. 15% MCA
4/14/1983	PUMPED 68 BBLS HCl ACID 28%, 7 MIN PER BBL 1000 psi. INCREASED PUMP psi TO 1200 psi, RATE 4 MIN PER BBL. INCREASE PUMP psi TO 1500 psi, RATE 2 MIN PER BBL. INCREASE PUMP RATE psi 1800 psi, NO INCREASE IN PUMP RATE. INCREASE PUMP psi TO 2000 psi, 3/4 BBL PER MIN. INCREASE PUMP psi TO 2200 psi, 3 BBL PER MIN. PUMPED 1200 BBLS OF FRESH WATER AT 2200 psi. WELL FLOWED BACK 200 BBLS OF WATER AND ACID GAS.
4/15/1983	PERF 5220' - 5262', 4 HOLES PER FT. SET PLUG.
4/16/1983	TEST FOR COMMUNICATION BETWEEN PERFS. PERFS ARE COMMUNICATING. TRIP IN HOLE WITH CEMENT RETAINER. SPOT 70 SX CLASS A CEMENT AT 5400'. SET CEMENT RETAINER AT 5200' AND SQUEEZED CEMENT 2400 psi. SPOT 100 SX CLASS A CEMENT AT 5200'. PERFORATE 3915' TO 3910', 4 SHOTS PER FOOT.
4/17/1983	SPOT 350 GALLONS MCA ACID AT PERFS. ACIDIZE WELL WITH 10,000 GALLONS HCl ACID. PUMPING 6 BBLS PER MIN AT 500 psi. DROPPED 100 PERF BALLS. PUMPING 7 BBLS PER MINUTE AT 800 psi. DROPPING PER BALLS. PUMPING 8 BBLS PER MINUTE AT 700 psi. 9-1/2 BBLS PER MINUTE AT 800 psi. DISPLACED ACID AT 10 BBLS PER MINUTE AT 800 psi. PUMPING FRESH WATER AT 9-1/2 BBLS PER MINUTE AT 700 psi. PUMPED 787 BBLS OF FRESH WATER AT 11.25 BBLS PER MINTUE AT 550 psi WITH RIG PUMP.
4/17/1983	REWORK COMPLETED. TD AFTER REWORK 4900'.
9/25/1985	PLUGGING STARTED SPOT 200 SX HOWCOLITE CEMENT PLUG @ 4864' SPOT 100 SX THIX-O-TROPIC @ 3922' SPOT 100 SX THIX-O-TROPIC @ 3875' SPOT 194 SX HOWCOLITE @ 3583' SPOT 194 SX HOWCOLITE @ 2743' SPOT 194 SX HOWCOLITE @ 1904' SPOT 118 SX HOWCOLITE @ 1061' SPOT 100 SX HALLIBURTON COMMON @ 561' AND 281' CUT OFF 13-3/8" AND 9-5/8" CASING 3' BELOW GROUND. CAP WITH 1/2" AND 1/4" PLATE RESPECTIVELY.
9/27/1985	PLUGGING COMPLETED.



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)  
Submit in DUPLICATE Within 30 Days after Well Completion

MAY 3 1983

PERMIT NUMBER  
36506  
DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Willmet, Inc. 2250 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Compton #1-13						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION SW SE NE		SECTION 13	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 330 Ft. from South Line and 961 Ft. from East Line of quarter section						COUNTY NAME Osceola	
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South) _____ (East/West) _____ Ft. from _____ Line and _____ Ft. from _____ Line of quarter section						COUNTY NAME	
DATE	DRILLING BEGUN 2-26-83		TOTAL DEPTH OF WELL Driller 8310 Log 8311		TYPE WELL Dry Hole		ELEVATIONS
	DRILLING COMPLETED 3-26-83		FORMATION AT T.D. Cincinnatian		FT. DRLD. - ROTARY TOOLS From 0 To 8311		
	WELL COMPLETED		PRODUCING FORMATION(S)		FT. DRLD. - CABLE TOOLS From _____ To _____		
					K.B. 1043.9	R.F. 1043.6	
					R.T.	Grd. 1027.4	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
24"	100'	DP					YES	NO
13 3/8"	730'	800 Sx				NONE		
9 5/8"	5466'	1370 Sx						

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
NONE							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Det. Rv. Sour	Gas	4500	X			X		
				Reed Cty Dol	Gas	4000				X		
				Trav. Lime	Gas	3500				X		

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	NONE		NONE				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	100-8311			2100	1°			
Birdwell		Dual Micro	3000-8311			2500	1/2°			
		NCT	5464-8308			4500	3/4°			
		Sonic	200-8311			7300	1 1/4°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
4/21/83	William E. Booker, Geologist	<i>William E. Booker</i>

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

APR 06 1983 *js*  
*lpc*

LEAVE BLANK
DEEPENING PERMIT NUMBER
DATE ISSUED

APPLICATION  
TO  
CHANGE WELL STATUS  
(SUBMIT IN QUADRUPLICATE)

APR 8 1983

PERMIT NUMBER 36506	FIELD NAME Wildcat	
NAME AND ADDRESS OF WELL OWNER Willmet Inc. 2250 Enterprise Dr. Mt. Pleasant, Mi. 48858		
LEASE OR FARM NAME Compton	WELL NUMBER 1-13	
WELL LOCATION SW SE NE,	SECTION 13 T. 17N R. 9W	TOWNSHIP Hersey COUNTY Osceola
(Deepen, Plug Back, Convert to Injection or Disposal Well, Temporarily Abandon etc.)		
APPROVAL REQUESTED TO plug back and convert to brine disposal		
DATE DRILLING COMPLETED 3/26/83	DATE LAST PRODUCED -----	LAST PRODUCTION (Amt/day) OIL, WTR., M.C.F. GAS
WORK TO BE DONE BY Provins #7		WILL START (DATE) 3/27/83

CASING AND CEMENTING RECORD			
SIZE CASING	DEPTH SET	NO. SACKS CEMENT	PERFORATIONS
24"	100		
133/8"	730	800	
95/8"	5466	1410	

FORMATION RECORD  
(Formation and depth, Oil, Gas & Wtr. shows, etc.)

C O N F I D E N T I A L

DESCRIBE PROPOSED WORK IN DETAIL:

Plug back as per Mineral Wells instructions: Class A cmt. 8310-7850, gel cmt. 7850-5700, class A cmt. 5700-5300. Clean out to 5420 and set BR Perf Bois Blanc, 4 spf. Test inj. rate. If unsuccessful, will set retainer and squeeze perfs, using 50 sx cmt. Then will perf. and test Dundee for injection. If completed, tubg. will be set on packer just above perfs. Annulus to be loaded w/inhibited water and have wellhead connections for monitoring. Surf. facility plan to be submitted before construction. This approval is temporary and is subject to review and revocation if not in compliance with standards for the injection of brine approved for the State of Michigan by the USEPA.

The proposed work as outlined above and approved by the Supervisor or his Authorized Representative will be executed in accordance with the provisions of Act 61, P.A. 1939 and/or Act 326, P.A. 1937 and the rules and regulations issued and adopted thereunder.

SIGNATURE (Well Owner or Authorized Representative) <i>James T. Jumper</i>		DATE
APPROVED BY: <i>Michael J. Hays</i>	FIELD OFFICE CADILLAC	DATE 4/6/83

NOTE: WELL REWORK RECORD, Form R-7212, is to be filled in DUPLICATE within 30 days after completion.

R 7237 3/73

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
SUPERVISOR OF WELLS

**WELL REWORK RECORD**

FILE IN DUPLICATE WITHIN 30 DAYS AFTER COMPLETION OF REWORK OR DEEPENING  
(Replaces GS 38)

GADILLAC HAS COPY  
JUN 27 1983 JUN 03 1983

PERMIT NUMBER 36506	DEEPENING PERMIT NUMBER	FIELD NAME Wildcat
NAME AND ADDRESS OF WELL OWNER PPG Oil & Gas Co., 2250 Enterprise Drive, Mt. Pleasant, MI 48858		
LEASE OR FARM NAME Compton		WELL NUMBER 1-13
WELL LOCATION SW SE NE	SECTION 13	TOWNSHIP T. 17N R. 9W Hersey
COUNTY Osceola		
WELL COMPLETED FOR (Oil, Gas, Gas Storage, Brine Disposal, Water Injection, etc.) Brine Disposal	TOTAL DEPTH AFTER REWORK 4900	MECHANICAL LOGS RUN
WELL COMPLETED IN (Name Rock Formation and Zone of Completion) Reed City Dolomite	DATE REWORK COMMENCED 4-12-83	DATE REWORK COMPLETED 4-17-83
NAME AND ADDRESS OF CONTRACTOR T. D. Provins Drilling Co., 2113 Enterprise Drive, Mt. Pleasant, MI 48858		

**WELL CASING RECORD - BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
24"	100	DP					
13 3/8"	730	800				1000 gal. MCA-15%	Squeezed thru cement
9 5/8"	5466	1370		5324	5355	3000 Gal. 28%	70 sx retainer set
				5220	5262		at 5200
				3815	3910	350 Gal. MCA	Open
						10,000 28% HCl	

**WELL CASING RECORD - AFTER REWORK (Indicate additions and changes only)**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		

**DESCRIBE REWORK OPERATIONS IN DETAIL**

- 3-29-83 Tripped in hole open ended and spotted 200 sx Class A at 8310, spotted 550 sx POZ at 7838, spotted 175 sx Class A at 5715.
- 4-12-83 Rigged up.
- 4-13-83 Displaced hole with FW - perfed 5324-5355.
- 4-14-83 Spotted 1,000 gal. 15% MCA.

(SEE ATTACHED)

IMPORTANT! SEE REVERSE SIDE

WELL REWORK RECORD, - REWORK OPERATIONS Continued

PPG Oil & Gas Co.

Compton #1-13

SW SE NE, Sec. 13, T17N R9W

Hersey Twp., Osceola Co.

- 4-14-83 Pumped 68 barrels HCl Acid 28%, 7 minutes per barrel 1000 psi. Increase pump psi to 1200 psi, rate 4 minutes per barrel. Increase pump psi to 1500 psi, rate 2 minutes per barrel. Increase pump rate psi to 1800 psi, no increase in pump rate. Increase pump psi to 2000 psi, 3/4 barrels per minute. Increase pump psi to 2200 psi, 3 barrels per minute. Pumped 1200 barrels of fresh water at 2200 psi. Well flowed back 200 barrels of water and acid gas.
- 4-15-83 Perforate 5220' - 5262', 4 holes per foot. Set plug.
- 4-16-83 Test for communication between perfs. Perfs are communicating. Trip in hole with cement retainer. Spot 70 sx Class A cement at 5400'. Set cement retainer at 5200' and squeezed cement 2400 psi. Spot 100 sx Class a cement at 5200'. Perforate 3815' to 3910', 4 shots per foot.
- 4-1-7-83 Spot 350 gallons MCA acid at perfs. Acidize well with 10,000 gallons HCl acid. Pumping 6 barrels per minute at 500 psi. Dropped 100 perf. balls. Pumping 7 barrels per minute at 800 psi. Dropping perf. balls. Pumping 8 barrels per minute at 700 psi. 9 1/2 barrels per minute at 800 psi. Displace acid at 10 barrels per minute at 800 psi. Pumping fresh water at 9 1/2 barrels per minute at 700 psi. Pumped 787 barrel of fresh water at 11.25 barrels per minute at 550 psi with rig pump.

STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

APR 26 1988

Filing for change of ownership of well is required in accordance with ☒ Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO 36506	WELL TYPE Dry Hole
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER Compton 1-13	
WELL LOCATION SW 1/4 SE 1/4 NE 1/4 SECTION 13 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil & Gas Co., Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil & Gas Co., Inc., Richard M. Rompala

*Richard M. Rompala*

3/3/88

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐

SINGLE WELL

☐

ATTACHED

☒

BLANKET

☒

ON FILE

BONDING CO. SAFECO Insurance Company of America

BOND NUMBER 5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Donald R. Hall

*Donald R. Hall*

3/28/88

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*L. J. Szyganski*

Signature

6/28/88

Date

DISTRIBUTION BY DNR

☒ Lansing

☐ Acquiring Owner

☐ Selling Owner

☐ Field



OWNER DISTRIBUTION  
Permittee — Orig & 1 copy  
Division Office — 2 copies  
Field Office — File copy  
Others — On request

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

PERMIT TO PLUG AND ABANDON

PERMIT NUMBER  
36506

FIELD NAME  
Hersey

NAME AND ADDRESS OF PERMITTEE  
PPG Oil & Gas

LEASE NAME AND WELL NO.  
Compton #1-13

LOCATION (1/4, 1/2, 3/4 or other) SECTION TOWNSHIP COUNTY  
SW SE NE, 13 T 17N R 9W Hersey Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.) DATE COMPLETED DATE PLUGGING WILL START PLUGGING PERMIT REQUESTED BY & DATE  
BDW 3/26/83 a.s.a.p. Don Smith

LAST PRODUCTION PLUGGING TO BE DONE BY  
BOPD BWPD MCFOPD DATE will notify

PERMIT MAILED TO COPIES MAILED TO

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
	24"	100'	DP		
	13-3/8"	730'	800	circ1	5355-24
	9-5/8"	5466'	1370	210	5265-20

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

KB 1043.9  
BOD 488 DD 3758 CLINTON 8022  
BL 1324 RCA 3828 CABOTHEAD 8158  
STRAY 1422 RCD 3830 MANIT 8237  
MARSH 1538 DRSZ 4486 CINC 8268  
SUNB 2459 RICH 4874 LTD 8311  
ELLS 2554 BS 6576  
ANT 2958 A2C 6944  
TF 3130 A2E 7083  
TL 3184 A1C 7453  
BSH 3700 NIA 7902

PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1936, as amended, and rules and orders adopted thereunder.

RIH; SET 9-5/8" CMT. RETAINER AT 5200'+.  
SQUEEZE 50 SX BELOW: SPOT 2200' CU FT. CMT.  
ABOVE FOR FILL UP. CUT CSG 3' BELOW GRD LEVEL  
& CAP W/CMT. & STEELPLATE.

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR SAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 106 OF ACT 294 P.A. 1985, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460 701 to 460 718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature) OFFICE CADILLAC D#6 DATE 9/25/85

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPPLICATE within 30 days after completion.

R-7229  
Rev. 11/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

CADILLAC HAS COPY

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER

36506

FIELD NAME

Hersey

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc.

COMPLETE LEASE OR FARM NAME(S)

Compton

WELL NUMBER

1-13

WELL LOCATION

SW 1/4 SE 1/4 NE 1/4 SEC. 13 T. 17N R. 9W

TOWNSHIP

Hersey

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry

TOTAL DEPTH

8311

FORMATION

Cincinnatian

DATE PLUGGING STARTED

9-25-85

DATE PLUGGING COMPLETED

9-27-85

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT ON ~~XXXXXX~~

Mike Moss

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	100'		
13 3/8"	730'	800'	
9 5/8"	5,466'	1370'	

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Chet Lowery

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED Previously plugged with 200 sx @ 8310', 550 sx @ 7838', 175 sx @ 5715' and 100 sx bridge plug @ 5200'. (3/27/83)

Halliburton spot 205 sx Howcolite cement plug @ 4864'

100 sx Thix-o-tropic @ 3922'

100 sx " @ 3875'

194 sx Howcolite @ 3583'

194 sx " @ 2743'

194 sx Howcolite @ 1904'

118 sx " @ 1061'

100 sx Halliburton Commor. @ 561' and 281'

Cut off 13 3/8" and 9 5/8" casing 3' below ground. Cap with 1/2" and 1/4" plate respectively.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

Donald P. Smith

COMPANY NAME AND ADDRESS

PPG Oil & Gas Co., Inc.  
2258 Enterprise Drive  
Mt. Pleasant, MI 48858

SIGNATURE

*[Signature]*

DATE (Month, Day, Year)

10/16/85



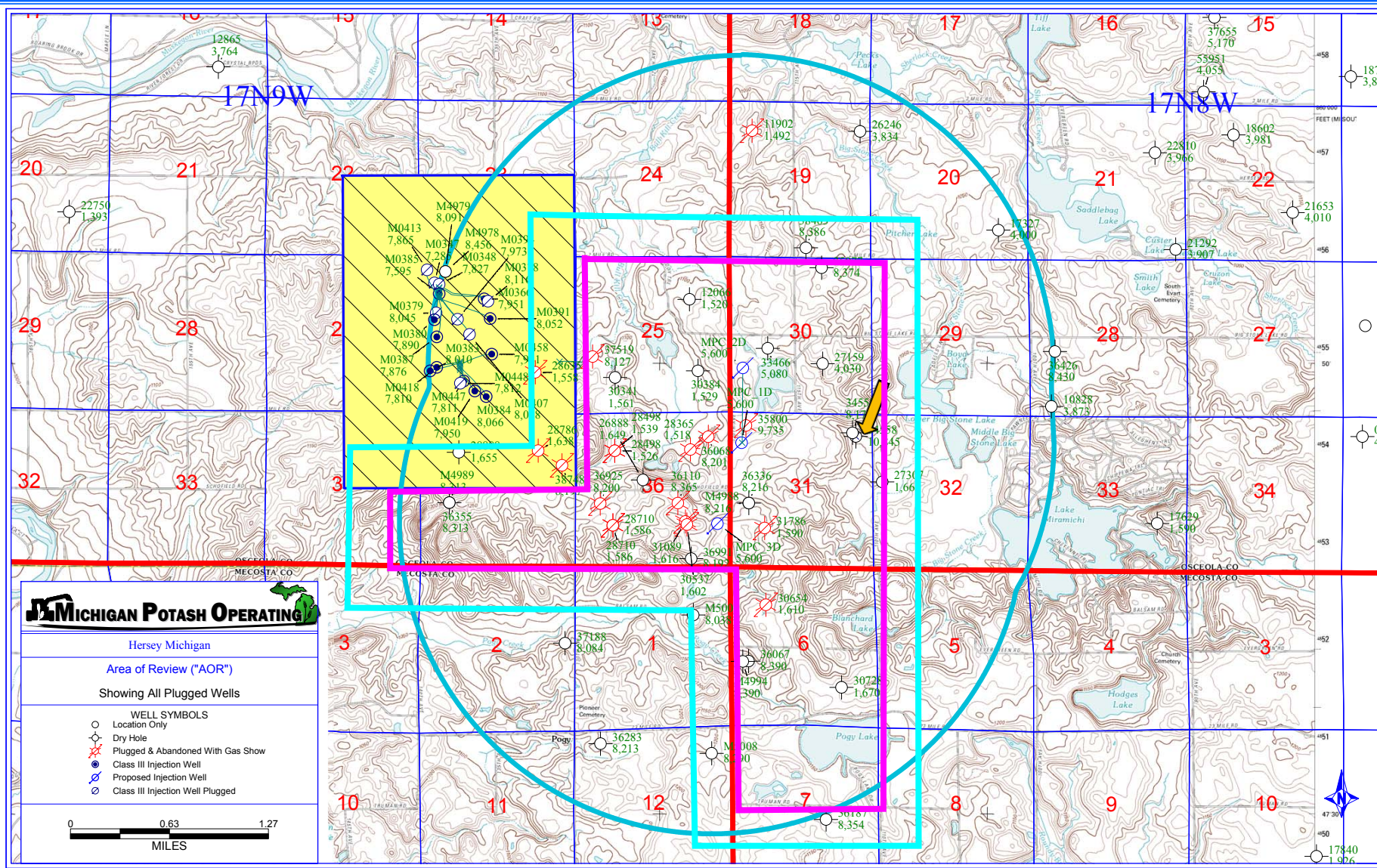
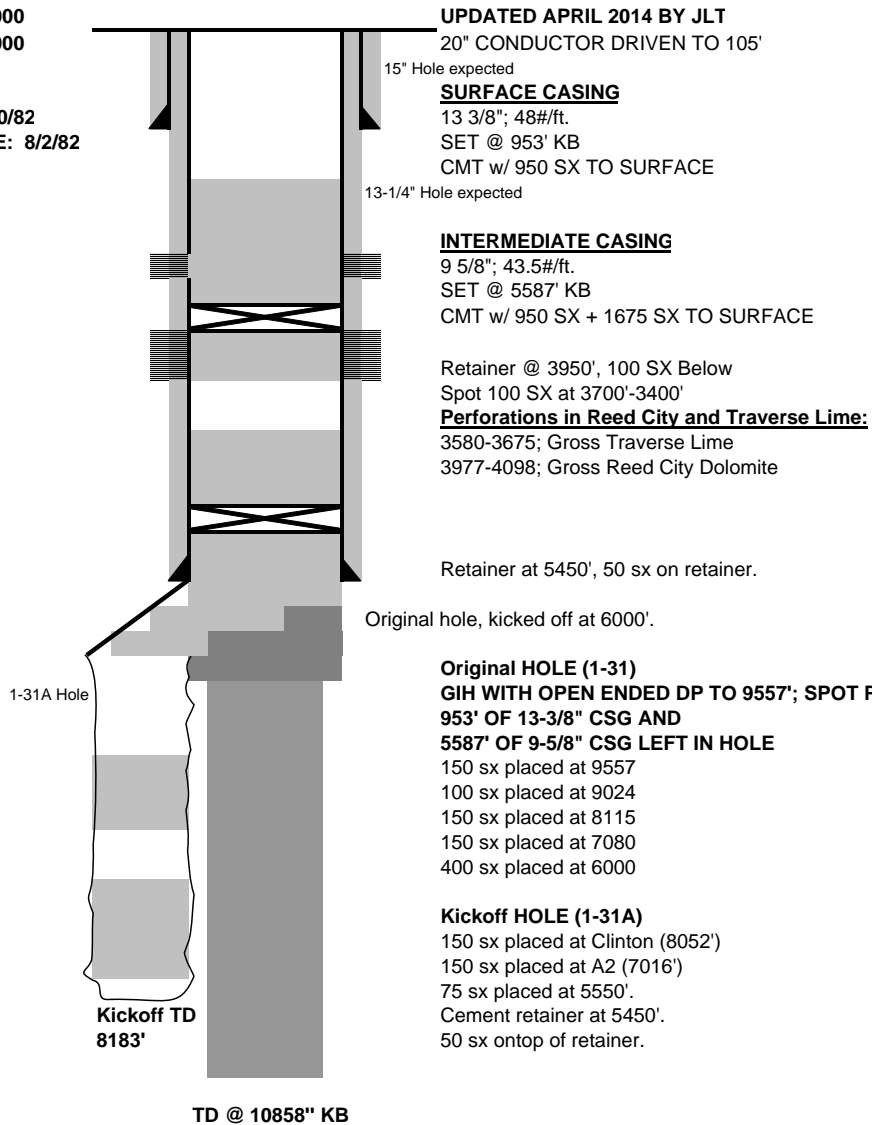


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**FREUDENBURG 1-31, 1-31A**  
SE NE NE Sec 31 T17N R8W  
OSCEOLA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

API No. 21-133-34558-0000  
API No. 21-133-34558-0000  
GL @ 1099"  
KB @ 1117"  
WELL COMPLETION DATE: 2/10/82  
PLUGGING COMPLETION DATE: 8/2/82



**FREUDENBURG 1-31, 1-31A WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
5/13/1981	SPUD.
7/31/1981	DRILLING COMPLETED. FORMATION AT TD TREMPLEAU. TD 10858'. 20" CONDUCTOR SET AT 102.6' 13 3/8" SET AT 953'; 950 SX 9 5/8" SET AT 5587'; 950 SX + 1675 SX
7/31/1981	ORIGINAL HOLE, DRILL AND ABANDON START DATE GIH WITH OPEN ENDED DP TO 9557'; SPOT PLUGS WHILE COOH. WOC PREPARING TO SIDE TRACK FOR FREUDENBURG 1-31A AND TO TEST UPHOLE INTERVALS CEMENT PLUG @ 9557' 150 SX CEMENT PLUG @ 9024' 100 SX CEMENT PLUG @ 8115' 150 SX CEMENT PLUG @ 7080' 150 SX CEMENT PLUG @ 6000' 400 SX KOP
7/31/1981	ORIGINAL HOLE FILLED WITH CEMENT TO BASE OF INTERMEDIATE.
8/2/1981	Begin Directional Kick-off
8/13/1981	IN KICKOFF HOLE, SPOT 150 SX ACROSS CLINTON. SPOT 150 ACROSS A2. SPOT 75 SX ACROSS 9 5/8" SHOE. SET 9 5/8" RETAINER AT 5450'. SPOT ANOTHER 50 SX ON TOP OF RETAINER.
1/16/1982	Perf 4080-4098. Reed City Dolomite
1/22/1982	Perf 3979-4045. Reed City Dolomite, Dundee
2/1/1982	Perf 3671
2/2/1982	Perf 3623-3668
2/10/1982	Set Cement Retainer @3948. Squeeze with 100 SX. Spot 100 SX from 3700-3400



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)  
Submit in DUPLICATE Within 30 Days after Well Completion

PERMIT NUMBER  
**34558**  
DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT <b>JBM Petroleum Corp. 2250 Enterprise Dr. Mt. Pleasant, MI 48858</b>				NAME & ADDRESS OF DRILLING CONTRACTOR(S) <b>Cardinal Drilling Co. Calgary, Alberta Canada</b>			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT <b>Freudenburg #1-31</b>						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION <b>881/4 NE1/4 NE1/4</b>		SECTION <b>31</b>		TOWNSHIP <b>17N</b>		RANGE <b>8W</b>	
TOWNSHIP NAME <b>Evart</b>		COUNTY NAME <b>Oscoda</b>					
FOOTAGES (North/South) <b>750</b> Ft. from <b>N</b> Line and <b>550</b> Ft. from <b>E</b> Line of quarter section							
SUBSURFACE LOCATION <b>same</b>		SECTION		TOWNSHIP		RANGE	
TOWNSHIP NAME		COUNTY NAME					
FOOTAGES (North/South)		(East/West)					
Ft. from		Line and		Ft. from		Line of quarter section	
DRILLING BEGUN <b>5/13/81</b>		TOTAL DEPTH OF WELL Driller <b>10858</b> Log <b>10845</b>		TYPE WELL <b>Dry hole</b>		ELEVATIONS	
DRILLING COMPLETED <b>7/31/81</b>		FORMATION AT T.D. <b>Trempealeau</b>		FT. DRLD. - ROTARY TOOLS From <b>0</b> To <b>10858</b>		K.B. <b>1117'</b> R.F. <b>1116'</b>	
WELL COMPLETED <b>2/10/82</b>		PRODUCING FORMATION(S) <b>None</b>		FT. DRLD. - CABLE TOOLS From To		R.T. Grd. <b>1099'</b>	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
							YES	NO
<b>13 5/8</b>	<b>953</b>	<b>950 sx</b>						
<b>9 5/8</b>	<b>5587</b>	<b>950 sx (1st stage)</b>						
		<b>1675 sx (2nd stage)</b>				See attached sheet		
	<b>(none pulled)</b>							

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
							Samp-les	Odor	Pits	Mud Line	Gas Log	Fill Up
<b>None</b>												

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
			<b>Det. Riv.</b>		<b>X</b>	<b>4169</b>	<b>600 bbls.</b>
	<b>See attached sheet</b>						

MECHANICAL LOGS, LIST EACH TYPE RUN


DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTN	RUN AT	DEGREES	YES	NO	DEPTH
<b>Schlumberger</b>		<b>SEE ATTACHED SHEET</b>				<b>2657</b>	<b>0°</b>			
<b>Birdwell</b>						<b>6262</b>	<b>1/8°</b>			
						<b>7300</b>	<b>1 1/2°</b>			
						<b>8211</b>	<b>1/4°</b>			
						<b>8744</b>	<b>1°</b>			
						<b>10858</b>	<b>2°</b>			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
<b>8/11/81</b>	<b>Ronald J. DeHaas</b>	

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

SEP 21 1981

EXSING HAS COPY

PERMIT NUMBER

34558

SEP 23 1981

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

JEM Petroleum Corp., 2250 Enterprise Dr., Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

Freudenburg

WELL NUMBER

1-31

WELL LOCATION

SE 1/4 NE 1/4 NE 1/4 SEC. 31 T. 17N R. 8W

TOWNSHIP

Evart

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

TOTAL DEPTH

10858'

FORMATION

Trempealeau

DATE PLUGGING STARTED

7/31/81

DATE PLUGGING COMPLETED

7/31/81

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Michael Moss

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
13 3/8	953'	-	
9 5/8	5587'	-	

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	9557	150 sx
	9024	100 sx
	8115	150 sx
	7080	150 sx
	6000	KOP 400 sx

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☒ YES ☐ NO

If yes, give details:

953' of 13 3/8 csg and 5587' of 9 5/8 csg left in hole

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Dowell

Was the well plugged by a Company or Contractor other than Owner or Operator?

☒ YES ☐ NO

If yes, give name and address:

Dowell

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Jesse Adams, Paul Proust

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED GIH with open ended DP to 9557; spot plugs while COOH. WOC preparing to side track for Freudenburg 1-31A and to test uphole intervals.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

Ronald J. DeHaas, Consulting Petroleum Geologist

COMPANY NAME AND ADDRESS

SIGNATURE



DATE (Month, Day, Year)

9/8/81

# OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

Supplemental Plugging Data and Site Conditions:

9/24/81 all records in. Hole directionally redrilled under PN34852. OK for  
GS approval. Snider

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

SIGNATURE	DIVISION	DATE
John Snider	Geology	9/24/81

DNR DISTRIBUTION  
Permittee — Orig. & 1 copy  
Division Office — 2 copies  
Field Office — File copy  
Others — On request

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
PERMIT TO PLUG AND ABANDON

PERMIT NUMBER  
**34558**  
FIELD NAME  
**Wildcat**

NAME AND ADDRESS OF PERMITTEE

**JEM Petroleum**

LEASE NAME AND WELL NO.

**Fruedenburg #1-31**

LOCATION (¼ ¼ ¼ or other)

**SE NE NE,**

SECTION

**31**

T **17N R 8W**

TOWNSHIP

**Evart**

COUNTY

**Osceola**

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

**Dry**

DATE COMPLETED

**7/30/81**

DATE PLUGGING WILL START

**7/31/81**

PLUGGING PERMIT REQUESTED BY & DATE

**J. Adams 7/30/81**

LAST PRODUCTION

BOPD

BWPD

MCFGPD

DATE

PLUGGING TO BE DONE BY

**Cardinal #21**

PERMIT MAILED TO

COPIES MAILED TO

**JEM Petroleum**

**Suite 235**

**5700 S. Quebec, Englewood, CO 80111**

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP.	PERFORATIONS
	<b>20"</b>	<b>105</b>	<b>DP</b>		
	<b>13 3/8</b>	<b>953</b>	<b>950 sx</b>	<b>surf</b>	
	<b>95/8"</b>	<b>5589</b>	<b>2600 sx</b>	<b>surf</b>	

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

**1116.0' KB**  
**TD 10858**

**TOPS CONFIDENTIAL:**

PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

**Spot 150 sx cmt. 100' below top of PDC.**  
**Spot 100 sx cmt. 50' below top of Trenton.**  
**Spot 150 sx cmt. 50' below top of Clinton.**  
**Spot 150 sx cmt. 50' below top of A2C.**  
**Spot 400 sx cmt. kick off plug at 6000'; Remainder of**  
**hole to be saved for sidetrack well.**

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

*Michael J. Wood*

OFFICE

**Cadillac D#6**

DATE

**8/11/81**

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

R-7229  
Rev. 11/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

AUG 24 1981  
AUG 20 1981

LEAVE BLANK
DEEPENING PERMIT NUMBER
DATE ISSUED

APPLICATION  
TO  
CHANGE WELL STATUS  
(SUBMIT IN QUADRUPLICATE)

PERMIT NUMBER <b>34852</b>	FIELD NAME				
NAME AND ADDRESS OF WELL OWNER <b>JEM Petroleum</b>					
LEASE OR FARM NAME <b>Frudenburg</b>	WELL NUMBER <b>1-31 "A"</b>				
WELL LOCATION <b>SL: SE NE NE,</b>	SECTION <b>31</b>	TOWNSHIP <b>17N</b>	R. <b>8W</b>	TOWNSHIP <b>Evart</b>	COUNTY <b>Osceola</b>
(Deepen, Plug Back, Convert to Injection or Disposal Well, Temporarily Abandon etc.)					
APPROVAL REQUESTED TO <b>Plug back to test upper zones</b>					
DATE DRILLING COMPLETED <b>8/13/81</b>	DATE LAST PRODUCED <b>---</b>	LAST PRODUCTION (Amt/day)		OIL, WTR., M.C.F. GAS	
WORK TO BE DONE BY <b>Cardinal #21</b>					WILL START (DATE) <b>8/13/81</b>

CASING AND CEMENTING RECORD			
SIZE CASING	DEPTH SET	NO. SACKS CEMENT	PERFORATIONS
20"	105	DP	
133/8"	953	950	
95/8"	5589	2600	

FORMATION RECORD  
(Formation and depth, Oil, Gas & Wtr. shows, etc.)

CONFIDENTIAL

DESCRIBE PROPOSED WORK IN DETAIL:

Ran DP thru top Clinton and spot 150 sx C1 A cmt; 150 sx thru A2C. Set 95/8" cmt. retnr 5450'± in cmt after spotting 75 sx at 5550', pulled 1 stand. Closed retainer; spotted 50 sx top retnr.

Remainder of hole to be used for selectively testing potential pay zones.

The proposed work as outlined above and approved by the Supervisor or his Authorized Representative will be executed in accordance with the provisions of Act 61, P.A. 1939 and/or Act 326, P.A. 1937 and the rules and regulations issued and adopted thereunder.		
SIGNATURE (Well Owner or Authorized Representative) <i>Samuel Brown</i>		DATE <b>8/16/81</b>
APPROVED BY: <i>John R. Randles</i>	FIELD OFFICE <i>Adrian</i>	DATE <b>8/20/81</b>

NOTE: WELL WORK RECORD, Form R-7212, is to be filled in DUPLICATE within 30 days after completion.

R 7237 3/73



**PERMIT DISTRIBUTION**

Permittee — Orig & 1 copy  
Division Office — 2 copies  
Field Office — File copy  
Others — On request

**STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION**

**PERMIT TO PLUG AND ABANDON**

PERMIT NUMBER  
**34852**

FIELD NAME

NAME AND ADDRESS OF PERMITTEE  
**JEM PETROLEUM**

CASE NAME AND WELL NO.  
**FREUDENBURG #1-31"A"**

LOCATION (1/4 1/4 1/4 or other) SECTION TOWNSHIP COUNTY  
**SE NE NE, 31 T 17N R 10W Evart Osceola**

TYPE OF WELL (Oil, Gas, Dry Hole, etc.) DATE COMPLETED DATE PLUGGING WILL START PLUGGING PERMIT REQUESTED BY & DATE  
**Dry hole 2/3/82 2/9/82 2/3/82 C. Lowery**

LAST PRODUCTION PLUGGING TO BE DONE BY  
BWPD MCFGPD DATE **Dowell**

PERMIT MAILED TO COPIES MAILED TO

**JEM Petroleum  
2250 Enterprise, Box 221  
Mt. Pleasant, MI 48858**

**CASING AND CEMENTING RECORD**

WELL DIA	CASING DIA & WT/FT	DEPTH SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT TOP	PERFORATIONS
	20"	103			
	133/8"	953	950	surf	
	95/8"	5589	2600	"	4080-4098
					3977-4045
					3623-3675
					3580-3585

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

**C O N F I D E N T I A L**

**PLUGGING REQUIREMENTS\***

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

Set retainer at 3950 and squeeze 100 sx cmt.  
Spot 100 sx cmt. at 3700'.  
Cut csg off 3' below grd level & cap w/cmt & steel plate.

NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460 701 to 460 718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature) OFFICE DATE  
*Michael J. Moss* **Cadillac D#6** **4/20/82**

\* WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

R-7229  
Rev 11/77

This document paid for with State funds

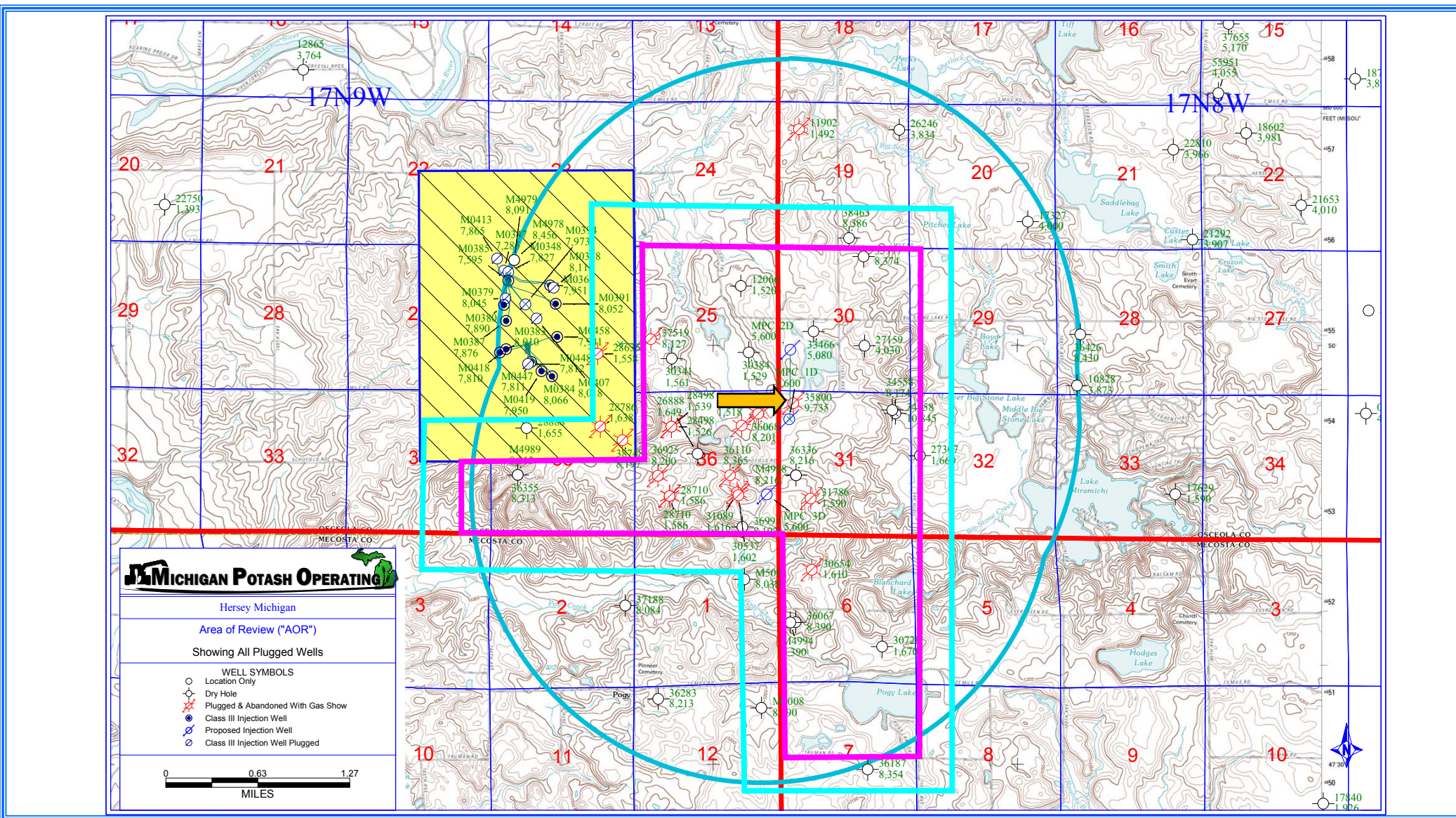


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**GRAY 1-31**  
**NE NW NW Sec 31 T17N R8W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

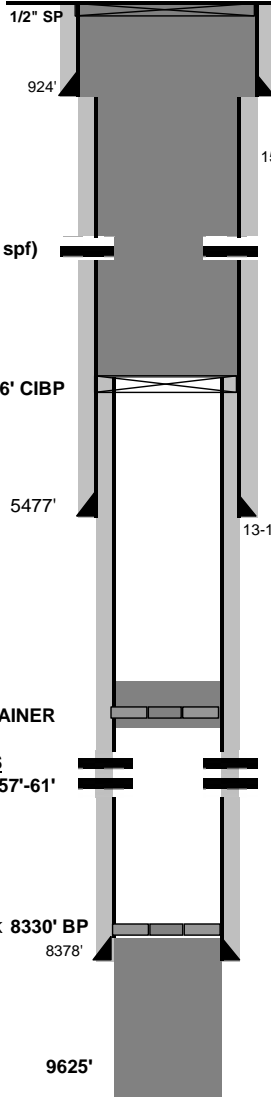
API No. 21-133-35800-0000  
GL @ 1137"  
KB @ 1153.5'  
WELL COMPLETION DATE: 9/8/82  
PLUGGING COMPLETION DATE: 1/6/87

BELL SHALE PERFS: 3885'-3895' (4 spf)

8100' CMT RETAINER  
  
CLINTON PERFS  
8137'-43'; 8148'-52'; 8157'-61'

TD AFTER REWORK 8330' BP  
8378'

9625'



**SURFACE CASING**

11 3/4"; 60#/ft.  
SET @ 924' KB  
CMT w/ 885 SX

**REWORK**

13-3/8"; 48#/ft.  
SET @ 926'  
CMT w/ 900 SX

15" Hole expected

**INTERMEDIATE CASING**

9 5/8"; 47#/ft.  
SET @ 5477' KB  
CMT w/ 150 SX  
TOC @ 3960'; PLUG @ 5416' PER TEMP SURVEY

**CLINTON PERFS:**

8137'-8143'; 2X/ft  
8148'-8152'; 2X/ft  
8157'-8161'; 2X/ft

**REWORK**

500 GALS. 20% NE

**PROD. CASING**

7"  
SET @ 8378' KB  
CMT w/ 1225 XS

13-1/4" Hole expected

**REWORK**

RAN DRILL PIPE TO 9625' AND SPOTTED 65 SX CL A,  
PULLED DRILL PIPE TO 8650' AND SPOTTED 65 SX INTO 7".  
SET BRIDGE PLUG AT APPROXIMATELY 8330',  
PERFORATED CLINTON AND SQUEEZED AWAY PERF ACID.

**PLUGGING**

SET 7" RETAINER AT 8100'; DRILLED OUT RETAINER AT 8145'.  
SQUEEZED 50 SX CL A CMT THRU RETAINER, 75 SX ON TOP  
SHOT OFF 7" CSG AT 4407' ABOVE FREE POINT  
SET 9-5/8" CIBP AT 4406' (ABOVE 7" STUB)  
PERFS: 3885'-3895' SHOOTING 4 spf USING 4" CASING GUN  
SQUEEZED 75 SX CL A CMT CONTAINING .6% RETARDER INTO PERFS  
SPOTTED 35 SX CL A CMT CONTAINING .6% RETARDER  
ON TOP OF RETAINER  
SHOT OFF 9-5/8" CSG AT 1480' AND PULLED  
SPOTTED 575 SX CL A CMT CONTAINING .6% RETARDER FROM 1601'-700'  
PULLED tbg TO 600', SPOTTED 225 SX CL A CMT CONTAINING .6%  
RETARDER FROM 600'-200'  
SPOT 20 SX CL A CMT AT SURFACE  
CUT OFF 13-3/8" AT BASE OF CELLAR 3' BELOW GROUND LEVEL AND  
CAPPED WITH 1/2" STEEL PLATE

TD @ 9769" KB/ 9755' LOG

**GRAY 1-31 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
6/5/1982	SPUD.
8/8/1982	DRILLING COMPLETED. FORMATION AT TD PRAIRIE DU CHIEN. TD 9769'. 11-3/4" CSG SET @ 924' w/ 885 SX CMT 9-5/8" CSG SET @ 5477' w/ 150 SX CMT 7" CSG SET @ 8378 w/ 1225 SX CMT
9/8/1982	WELL COMPLETED
8/10/1982	REWORK COMMENCED RAN DP TO 9625' AND SPOTTED 65 SX CL A, PULLED DP TO 8650' AND SPOTTED 65 SX INTO 7" SET BRIDGE PLUG AT APPROX. 8330' PERFORATED CLINTON AND SQUEEZED AWAY PERF ACID (500 GALS. 20% NE)  <b><u>CLINTON PERFS:</u></b> 8137'-8143'; 2X/ft 8148'-8152'; 2X/ft 8157'-8161'; 2X/ft
9/8/82`	REWORK COMPLETED. TD AFTER REWORK 8330'.
12/29/1986	PLUGGING START DATE SET 7" RETAINER @ 8100' SQUEEZED 50 SX CL A CMT THRU RETAINER, UNSTUNG FROM RETAINER AND PLACED 75 SX ON TOP SHOT OFF 7" CASING AT 4407' ABOVE FREE POINT SET 9-5/8" CAST IRON BRIDGE PLUG AT 4406' ( ABOVE 7" STUB) PERFORATED 3885'-3895' SHOOT 4 spf USING A 4" CASING GUN SQUEEZED 75 SX CL A CMT CONTAINING .6% RETARDER INTO PERFS SPOTTED 35 SX CL A CMT CONTAINING .6% RETARDER ON TOP OF RETAINER SHOT OFF 9-5/8" CASING AT 1480' AND PULLED SAME. SPOTTED 575 SX CL A CMT CONTAINING .6% RETARDER FROM 1601'-700' PULLED tbq TO 600', SPOTTED 225 SX CL A CMT CONTAININIG .6% RETARDER FROM 600'-200' SPOT 20 SX CL A CMT AT SURFACE CUT OFF 13-3/8" AT BASE OF CELLAR 3' BELOW GROUND LEVEL AND CAPPED WITH 1/2" STEEL PLATE
1/6/1987	PLUGGING COMPLETED.



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

SEP 23 1982

PERMIT NUMBER  
35800

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT

Willmet, Inc.  
2250 Enterprise Drive  
Mt. Pleasant, MI 48858

NAME & ADDRESS OF DRILLING CONTRACTOR(S)

T. D. Provins Drilling Company  
2113 Enterprise Drive  
Mt. Pleasant, MI 48858

LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT

Grey #1-31

DIRECTIONALLY DRILLED

YES ☐ NO ☒

SURFACE LOCATION

NE NW NW

SECTION

31

TOWNSHIP

17N

RANGE

8W

TOWNSHIP NAME

Evart

FOOTAGES (North/South)

460

Ft. from North

Line and 540

(East/West)

Ft. from West

Line of quarter section

COUNTY NAME

Osceola

SUBSURFACE LOCATION

SECTION

TOWNSHIP

RANGE

TOWNSHIP NAME

FOOTAGES (North/South)

Ft. from

Line and

(East/West)

Ft. from

Line of quarter section

COUNTY NAME

DRILLING BEGUN

6-5-82

TOTAL DEPTH OF WELL

Driller 9769 Log 9755

TYPE WELL

Gas

ELEVATIONS

DRILLING COMPLETED

8-8-82

FORMATION AT T.D.

Prairie du Chien

FT. DRD. - ROTARY TOOLS

From 0 To 9755

K.B.

1153.5

R.F.

1152.1

WELL COMPLETED

9-8-82

PRODUCING FORMATION(S)

Clinton

FT. DRD. - CABLE TOOLS

From To

R.T.

Grd.

1137

**CASING, CASING LINERS AND CEMENTING**

**PERFORATIONS**

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
11 3/4	924	885					YES	NO
9 5/8	5477	150		8-27-82	2x/Ft.	8137 - 43	X	
7	8378	1225		8-27-82		8148 - 52	X	
				8-27-82		8157 - 61	X	

**GROSS PAY INTERVALS**

**ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED**

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
Clinton	Gas	8136	8174	Antrim	Gas	3100	Sam- ples	Odor	Pits	Mud Line	Gas Log.	Fill Up
				Traverse Lm.	Gas	3600					X	
				R.C. Dolm.	Gas	3980					X	

**STIMULATION BY ACID OR FRACTURING**

**WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)**

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
8-27-82	500 Gals.	20 N.E. HCL	None				

**MECHANICAL LOGS, LIST EACH TYPE RUN**

**DEPTH CORRECTION**

**DEVIATION SURVEY**

**PLUGGED BACK**

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTN	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	900-9752			4075	3/4°			
Birdwell		BHC Sonic	" "			6450	1°			
		MLL-DLL	" "			7800	2 1/4°			
						8880	1°			

**PRODUCTION TEST DATA**

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
			1.438 7/64	1 bbl./hr.	0	4589-8160

CK

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
9-20-82	William E. Booker, Geologist	<i>William E. Booker</i>

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
SUPERVISOR OF WELLS

FEB 11 1983

LANSING HAS COPY

**WELL REWORK RECORD**

FILE IN DUPLICATE WITHIN 30 DAYS AFTER COMPLETION OF REWORK OR DEEPENING  
(Replaces GS 38)

PERMIT NUMBER 35800	DEEPENING PERMIT NUMBER	FIELD NAME Wildcat
NAME AND ADDRESS OF WELL OWNER Willmet, Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858		
LEASE OR FARM NAME Gray		WELL NUMBER 1-31
WELL LOCATION NE NW NW	SECTION 31 T. 17N R. 8W	TOWNSHIP Evart COUNTY Osceola
WELL COMPLETED FOR (Oil, Gas, Gas Storage, Brine Disposal, Water Injection, etc.) Gas	TOTAL DEPTH AFTER REWORK 8330	MECHANICAL LOGS RUN NO ADDITIONAL LOGS
WELL COMPLETED IN (Name Rock Formation and Zone of Completion) Clinton - (Burnt Bluff)	DATE REWORK COMMENCED 8-10-82	DATE REWORK COMPLETED 9-8-82
NAME AND ADDRESS OF CONTRACTOR T & J Tank Company, P. O. Box 228, Kalkaska, MI 49646		

**WELL CASING RECORD -- BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
24"	42'						
13 3/8"	926	900					
9 5/8"	5477	150					
7"	8378	1225					

**WELL CASING RECORD -- AFTER REWORK (Indicate additions and changes only)**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
7"	8378	1225	2x/ft	8137	43	500 gals. 20% NE	
			"	8148	52		
			"	8157	61		

**DESCRIBE REWORK OPERATIONS IN DETAIL**

Ran drill pipe to 9625 and spotted 65 sx Cl A, pulled drill pipe to 8650 and spotted 65 sx into 7". Set bridge plug at approximately 8330, perforated Clinton and squeezed away perf acid.

IMPORTANT! SEE REVERSE SIDE

R 7212  
Rev. 10/72

## GEOLOGICAL FORMATION RECORD OF DEEPENING

[illegible]

# DAILY PRODUCTION TEST RECORD

[illegible]

## DAILY INJECTION TEST RECORD IF INJECTION WELL (OR BDP)

[illegible]

SIGNATURE (Well Owner or Authorized Representative)

ADDRESS (if different than well owner)  
1425 S. Mission  
Mt. Pleasant, MI 48858

DATE (Month, Day, Year)

1-20-83

NOTE: IF GAS WELL, RECORD FLOW TEST UNDER "DAILY PRODUCTION TEST RECORD"

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

LANSING  
AUG 18 1982  
lpc  
AUG 23 1982

LEAVE BLANK
DEEPENING PERMIT NUMBER
DATE ISSUED

APPLICATION  
TO  
CHANGE WELL STATUS  
(SUBMIT IN QUADRUPLICATE)

PERMIT NUMBER 35800	FIELD NAME Wildcat				
NAME AND ADDRESS OF WELL OWNER Willmet Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858					
LEASE OR FARM NAME Gray	WELL NUMBER 1-31				
WELL LOCATION NE NW NW,	SECTION 31	T. 17N	R. 8W	TOWNSHIP Evart,	COUNTY Osceola
(Deepen, Plug Back, Convert to Injection or Disposal Well, Temporarily Abandon, etc.)					
APPROVAL REQUESTED TO plug back to complete in Clinton					
DATE DRILLING COMPLETED 8/8/82	DATE LAST PRODUCED -----	LAST PRODUCTION (Amt/day) OIL,		WTR.,	M.C.F. GAS
WORK TO BE DONE BY Halliburton					WILL START (DATE) asap

CASING AND CEMENTING RECORD			
SIZE CASING	DEPTH SET	NO. SACKS CEMENT	PERFORATIONS
24"	42		
133/8"	926	900	
95/8"	5477	150	
7"	8377	1225	

FORMATION RECORD  
(Formation and depth, Oil, Gas & Wtr. Shows, etc.)

TOPS CONFIDENTIAL

DTD 9744  
LTD 9751

DESCRIBE PROPOSED WORK IN DETAIL:

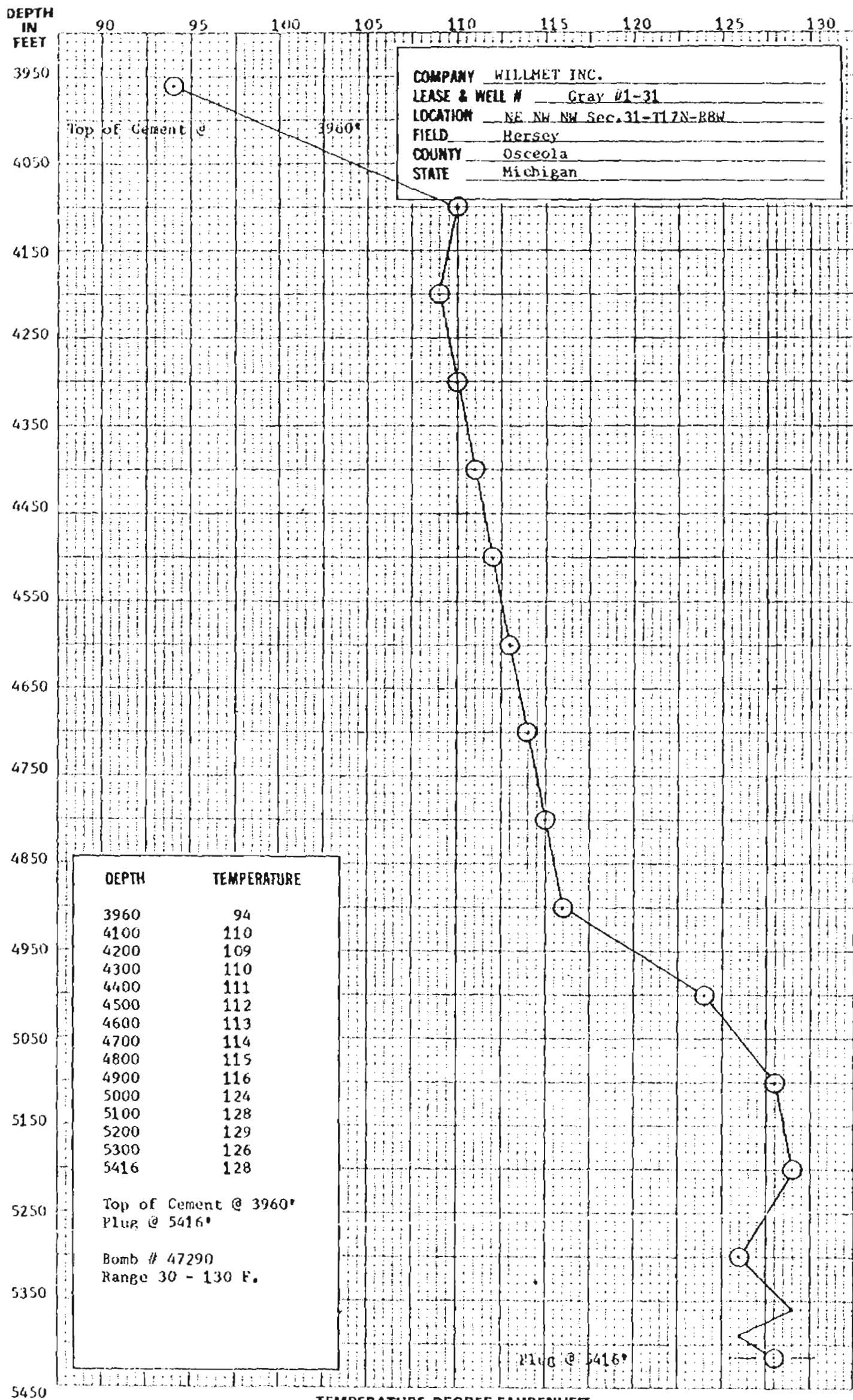
Run DP to 9625' and spot 65 sx C1 A cmt. or equal; pull DP to 8650' and spot 65 sx cmt. into shoe of 7". Dress off cmt. Set 7" BP 8340'±. Perforate 7" and complete well in Clinton Fm.

The proposed work as outlined above and approved by the Supervisor or his Authorized Representative will be executed in accordance with the provisions of Act 61, P.A. 1939 and/or Act 326, P.A. 1937 and the rules and regulations issued and adopted thereunder.		
SIGNATURE (Well Owner or Authorized Representative)	DATE	
<i>[Signature]</i>	Aug 17/82	
APPROVED BY:	FIELD OFFICE	DATE
<i>[Signature]</i>	<i>[Signature]</i>	8/18/82

NOTE: WELL REWORK RECORD, Form R-7212, is to be filled in DUPLICATE within 30 days after completion.

R 7237 3/73

## TEMPERATURE SURVEY



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
SUPERVISOR OF WELLS  
**WELL REWORK RECORD**

FILE IN DUPLICATE WITHIN 30 DAYS AFTER COMPLETION OF REWORK OR DEEPENING  
(Replaces GS 38)

LANSING  
JAN 24 1983  
JAN 26 1983  
CADILLAC HAS COPY

PERMIT NUMBER 35800 <i>OPG</i>	DEEPENING PERMIT NUMBER	FIELD NAME Wildcat
NAME AND ADDRESS OF WELL OWNER Willmet, Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858		
LEASE OR FARM NAME Gray		WELL NUMBER 1-31
WELL LOCATION NE NW NW	SECTION 31 T. 17N R. 8W	TOWNSHIP Evart COUNTY Osceola
WELL COMPLETED FOR (Oil, Gas, Gas Storage, Brine Disposal, Water Injection, etc.) Gas	TOTAL DEPTH AFTER REWORK 8330	MECHANICAL LOGS RUN NO ADDITIONAL LOGS
WELL COMPLETED IN (Name Rock Formation and Zone of Completion) Clinton - (Burnt Bluff)	DATE REWORK COMMENCED 8-10-82	DATE REWORK COMPLETED 9-8-82
NAME AND ADDRESS OF CONTRACTOR T & J Tank Company, P. O. Box 228, Kalkaska, MI 49646		

**WELL CASING RECORD - BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
24"	42'						
13 3/8"	926	900					
9 5/8"	5477	150					
7"	8378	1225					

**WELL CASING RECORD - AFTER REWORK (Indicate additions and changes only)**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
7"	8378	1225	2x/ft	8137	43	500 gals. 20% NE	
			"	8148	52		
			"	8157	61		

**DESCRIBE REWORK OPERATIONS IN DETAIL**

Ran drill pipe to 9625 and spotted 65 sx Cl A, pulled drill pipe to 8650 and spotted 65 sx into 7". Set bridge plug at approximately 8330, perforated Clinton and squeezed away perf acid.

IMPORTANT! SEE REVERSE SIDE



## GEOLOGICAL FORMATION RECORD OF DEEPENING

FROM	TO	FORMATION (type, color, hardness)	FROM	TO	FORMATION (type, color, hardness)

# DAILY PRODUCTION TEST RECORD

**DAILY INJECTION TEST RECORD IF INJECTION WELL (OR BDW)**

[illegible]

SIGNATURE (Well Owner or Authorized Representative)

ADDRESS (If different than well owner)

DATE (Month, Day, Year)

1425 S. Mission

Mt. Pleasant, MI 48858

1-20-83

**NOTE: IF GAS WELL, RECORD FLOW TEST UNDER "DAILY PRODUCTION TEST RECORD"**

STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

APR 26 1988

Filing for change of ownership of well is required in accordance with ☒ Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO 35800	WELL TYPE Dry Hole
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER Gray 1-31	
WELL LOCATION NE 1/4 NW 1/4 NW 1/4 SECTION 31 T 17N R 8W	
TOWNSHIP Evart	COUNTY Osceola

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil & Gas Company, Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by:

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil & Gas Company, Inc., Richard M. Rompala

*Richard M. Rompala*

3/31/88

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐ SINGLE WELL

☐ ATTACHED

BONDING CO. SAFECO Insurance Company of America

☒ BLANKET

☒ ON FILE

BOND NUMBER 5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Donald R. Hall

*Donald R. Hall* 3/28/88

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*[Signature]*  
Signature

6/28/88  
Date

DISTRIBUTION BY DNR

☒ Lansing

☐ Acquiring Owner

☐ Selling Owner

☐ Field

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

USE APPROPRIATE BLOCKS FOR ITEMS NOT LISTED SUBMIT ATTACHMENTS.  
REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT  
IN FINES AND/OR IMPRISONMENT.

**RECORD OF WELL:** ☒ **PLUGGING** ☐ **REWORK**  
(MAIL THREE COPIES TO THE DISTRICT OFFICE WITHIN 30 DAYS AFTER  
COMPLETION OF PLUGGING OR REWORK)

NAME AND ADDRESS OF WELL OWNER  
PPG Oil & Gas, Inc.  
One Jackson Square  
Suite 600  
Jackson, Michigan 49201

PERMIT NO 35800	TYPE OF WELL gas
FIELD/FACILITY NAME Hersey Evert	
WELL NAME & NUMBER Gray #1-31	
WELL LOCATION NE 1/4 of NW 1/4 of NW 1/4 Section 31 T 17N R 8W	
TOWNSHIP Evert	COUNTY Osceola
TOTAL DEPTH 9755' (Log)	FORMATION Burnt Bluff
PLUGGING/REWORK STARTING DATE 12/29/86	PLUGGING/REWORK COMPLETION DATE 1/6/87
TOTAL DEPTH AFTER REWORK 0-abandoned well	MECHANICAL LOGS RUN N.A.
WELL COMPLETED FOR P & A	FORMATION AND ZONE

CASING SIZE	WHERE SET	AMOUNT RECOVERED	SHOT OR RIPPED	TYPE OF BRIDGES OR PLUGS	DEPTH PLACED	SACKS OF CEMENT & ADDITIVES
13 3/8	926	none	NA	perforations 3885-3895		squeeze 75 sx
9 5/8	5477	1480	shot/1480	9 5/8" cmt. retainer	3875	thru ret into perf
						35 sx cmt on top
7"	8377	4423 (thru shot/4407	shot/4407	9 5/8 cast iron plug	4406	
		eads on)		7" cmt. retainer	8100	50 sx class A
						thru retain 75 class

WERE TOOLS, TUBING, CASING, ETC. LOST OR LEFT IN THE HOLE BEFORE OR  
AFTER PLUGGING? IF YES, GIVE DETAILS.

see above casing recovery

DID A SERVICE COMPANY PUMP MUD, SPOT CEMENT, OR SET BRIDGE PLUGS?  
IF YES, GIVE NAME AND ADDRESS.

Halliburton Services  
PO Box 519  
Kalkaska, Michigan 49646

WELL PLUGGING/REWORK CONTRACTOR AND ADDRESS

Well Tech. Inc.  
2255 Parkway  
Mt. Pleasant, Michigan 48858

PERMITEE'S PLUGGING WITNESS

Timothy L. Baker

NAME(S) OF DNR REPRESENTATIVE WHO

Jack Snider

☒ ISSUED PERMIT

☐ WITNESSED PLUGGING

**WELL CASING RECORD — BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture	Perforations
Size	Depth	Sacks	Type	From	To	Treatment Record	If plugged, how?
13 3/8"	926	685	reg poz	8137	8140	500 gal HCl	
		200	class A	8137	8143	500 gal HCl	retainer at 8100
9 5/8"	5477	150	class A	8148	8152		drilled out
7"	8377	1100	special H	8157	8161		retainer at 8145
			class A-4% gel				

**WELL CASING RECORD — AFTER REWORK (Indicate additions and changes only)**

Casing		Cement		Perforations		Acid or Fracture	Perforations
Size	Depth	Sacks	Type	From	To	Treatment Record	If plugged, how?
9 5/8"	5477 to 8140						
7"	8377 to 8407						

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED OR REWORKED.

see attached sheet

**GEOLOGICAL SURVEY**

**MAR 26 1991**

**Permits & Bonding Unit**

[illegible]

**SOLUTION MINING FRACTURING RECORD: Pressure, Rate, Volume, and Name of Receiving Unit (Act 315, P.A. 1969, as amended)**

INITIAL TESTING AFTER REWORK (Disposal: Injection Rate and Pressure) (Act 315, P.A. 1969, as amended)  
(Brine: Original Fluid Level and Producing Rate)

## CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William L. Albert, Senior Production Engineer

**SIGNATURE**

NATURE  
11/1/1917

DATE \_\_\_\_\_

1/27/87

NOTE: BONDS CANNOT BE RELEASED UNTIL PLUGGING IS COMPLETED, CELLAR, RAT AND MOUSE HOLES, AND PITS FILLED. SITE LEVELED AND CLEANED AND RECORDS FILED.

FOR DNR USE ONLY — FINAL INSPECTIONS BY DEPARTMENT OF NATURAL RESOURCES REPRESENTATIVES		
SIGNATURE	DIVISION	DATE
DNR signature required by Form G-103. GSD Proc 3.3.8. 1/1/80 5-1-1-10		

Describe in detail how well was plugged or reworked.

1. Set 7" retainer at 8100'.
2. Squeezed 50 sx class A cement through retainer, unstung from retainer and placed 75 sx on top.
3. Shot off 7" casing at 4407' above free point.
4. Set 9 5/8" cast iron bridge plug at 4406 (above 7" stub).
5. Perforated 3885-3895 shooting 4 s.p.f. using a 4" casing gun.
6. Squeezed 75 sx class A cmt. containing .6% retarder into perforations.
7. Spotted 35 sx class A cement containing .6% retarder on top of retainer.
8. Shot off 9 5/8" casing at 1480 and pulled same.
9. Spotted 575 sx class A cement containing .6% retarder from 1601 to 700'.
10. Pulled tgb to 600', spotted 225 sx class A cement containing .6% retarder from 600' to 200'.
11. Spot 20 sx class A cement at surface.
12. Cut off 13 3/8 at base of cellar 8' below ground level and capped with 1/2" steel plate.

**GEOLOGICAL SURVEY**

**MAR 26 1991**

**Permits & Bonding Unit**



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30323  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 51, P.A. 1989, AS AMENDED ☐ ACT 315, P.A. 1989, AS AMENDED

APPLICATION TO (Submit 4 copies):

☐ CHANGE WELL STATUS ☒ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION (INJECTION AND TYPE OF FLUID  
Amount per day & reservoir pressure)

10 mcf/month

WORK TO BE DONE BY: ☒ APPROVAL MAILED

will notify

PERMIT NO. <b>35800</b>	TYPE OF WELL <b>Gas</b>
NAME AND ADDRESS OF WELL OWNER <input type="checkbox"/> APPROVAL MAILED <b>PPG Oil &amp; Gas Suite 1052 1 Jackson Sq. Jackson, MI 49204</b>	
FIELD/FACILITY NAME <b>Hersey Clinton Pool</b>	
WELL NAME <b>Gray</b>	WELL NO. <b>1-31</b>
WELL LOCATION <b>NE 1/4 of NW 1/4 of NW 1/4 Section 31 T17N R8W</b>	
TOWNSHIP <b>Evart</b>	COUNTY <b>Osceola</b>
DATE DRILLING COMPLETED <b>8/8/82</b>	DATE LAST PRODUCED/UTILIZED <b>10/84</b>
STARTING DATE <b>12/29/86</b>	

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
	113/4"	924	885	circl	8137-43
	95/8"	5477	150	4900	8148-52
	7"	8378	1225	circl	8157-61

FORMATION RECORD (Formation and depth of oil, gas and water shows, etc.):

KB 1153.5	NIA 7992
BOD 610	CLINT 8064
MARSH 1572 SLM JAY	CABOTHD 8194
TL 3314	TRENTON 8965
DD 3898	GLENWOOD 9460
RCD 3978	PDC 9556
DRSZ 4550	LTD 9755
RICH 4765	
BB 5262	
BI 5426	

DETAIL PROPOSED PROCEDURES:

Set 5 1/2" cmt. rtnr. at 8100'. Pump 50 sx cmt. thru perms. Close retrn. Leave 75 sx on top. FP 7" 5000'+. Set 95/8" BP at 4950' or top 7" stub. FP & pull 95/8" csg. RIH w/tubg. circl. w/10.4 mud and stabilize hole. Spot 125 sx at 4550'; 125 sx at 3900'; 125 sx at 3325'; 125 sx at 1650'; 150 sx at 975'; 20 sx on top. Cut 113/4" 3' below grade & cap w/1/2" steel plate.

FOR ADDITIONAL REQUIREMENTS:

**GEOLOGICAL SURVEY**  
**DEC 30 1985**  
**Permits & Bonding Unit**

DATE SIGNATURE (Authorized Representative)	DATE
APPROVED BY: <i>John W. Richards</i>	OFFICE: <b>Cadillac</b>
APPROVAL DATE: <b>12/23/86</b>	TERMINATION DATE:

NOTE: THREE COPIES OF WELL PLUGGING OR REMOVAL (PR 7200-6) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.

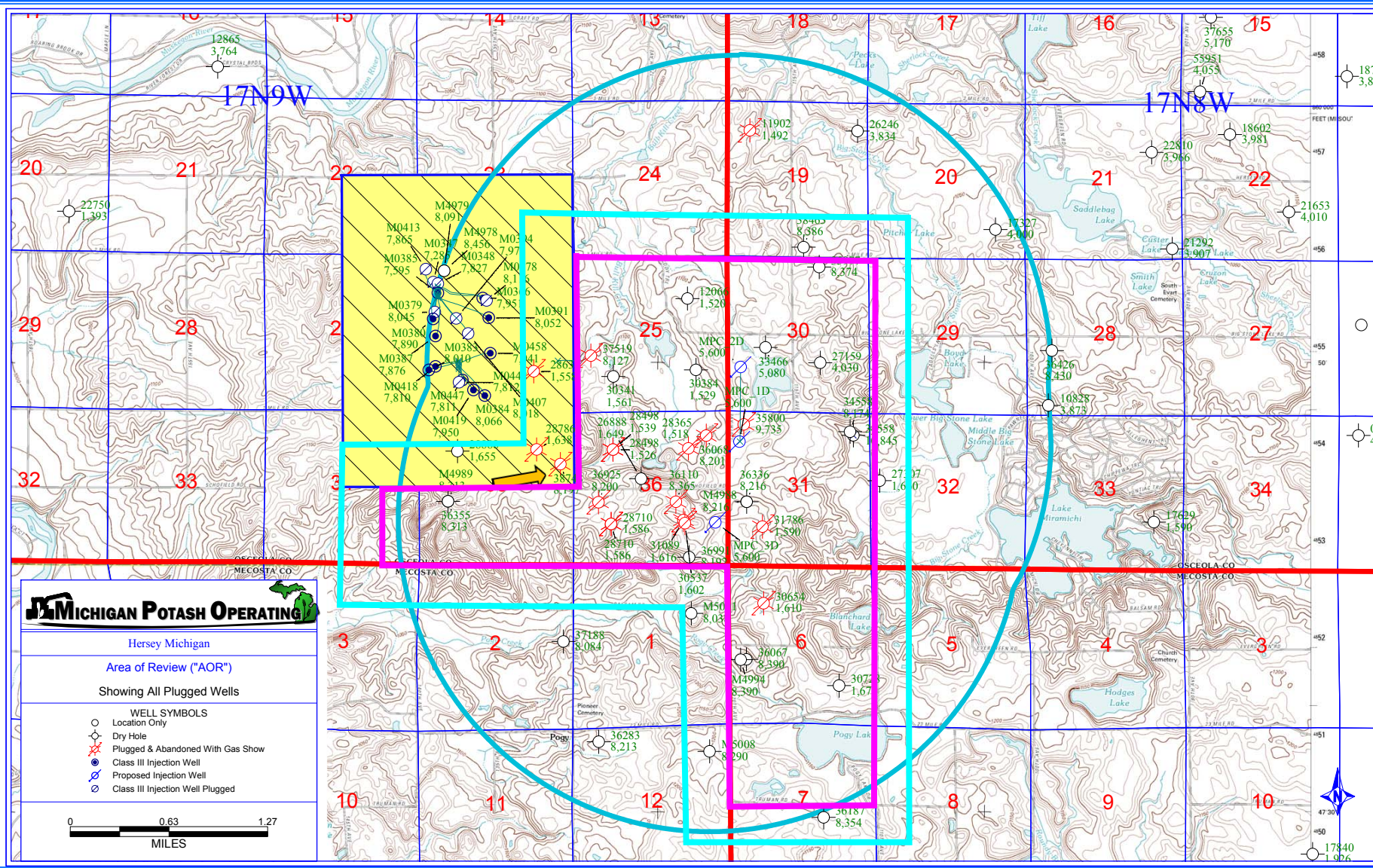
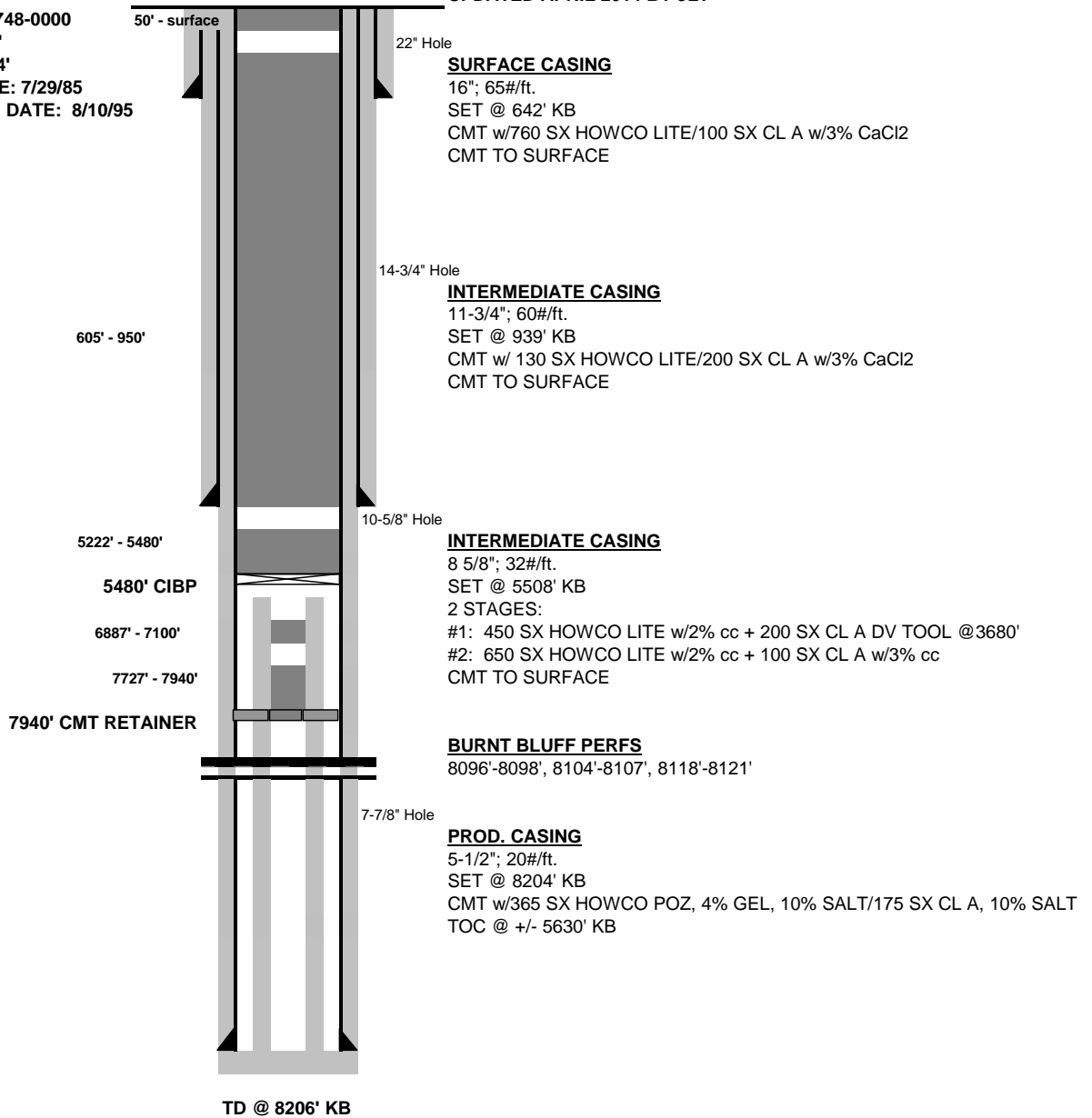


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**GREIN 1-35**  
**NE SE NE Sec 35 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

API No. 21-133-38748-0000  
GL @ 1199'  
KB @ 1215.4'  
WELL COMPLETION DATE: 7/29/85  
PLUGGING COMPLETION DATE: 8/10/95





### GREIN 1-35 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
6/5/1985	SPUD.
7/27/1985	PERFORATED 19 HOLES, 4/FT: 8096'-8098', 8104'-8107', 8118'-8121'
7/29/1985	WELL COMPLETED. FORMATION AT TD CABOT HEAD. PRODUCING FM BURNT BLUFF. 16" CSG SET AT 642'; 760 SX HOWCO LITE/100 SX CL A w/3% CaCl <sub>2</sub> 11-3/4" SET AT 939'; 130 SX HOWCO LITE/200 SX CL A w/3% CaCl <sub>2</sub> 8-5/8" SET AT 5508'; 2 STAGES: #1 450 SX HOWCO LITE w/2% cc + 200 SX CL A DV TOOL @3680', #2 650 SX HOWCO LITE w/2% cc + 100 SX CL A w/3% cc 5-1/2" SET AT 8204'; 365 SX HOWCO POS, 4% GEL, 10% SALT/175 SC CL A, 10% SALT
8/7/1995	PLUGGING STARTED RU A-1 CASING SERVICE AND PULL REMAINDER OF 5-1/2" CASING. ND BOP'S AND TUBING SPOOL, INSTALL 8-5/8" CAST IRON BRIDGE PLUG ON TUBING AND START IN HOLE, NU BOP'S AND SPOOL, TIH AND SET RETAINER AT 5480', STING OUT OF RETAINER AND BALANCE A 75 SX CL A CEMENT PLUG ON TOP OF RETAINER. TOOH LAYING DOWN TUBING TO 4800', WHERE 140 BBLs OF DRILLING MUD WAS SPOTTED IN HOLE, TUBING WAS THEN PULLED TO 950' WHERE A 100 SX CL A CEMENT PLUG WAS SPOTTED TUBING WAS PULLED FROM HOLE AND CASING WAS FILLED TO SURFACE WITH 15 SX CL A CEMENT. BOP'S AND HEAD WERE REMOVED FROM WELL, RD HALLIBURTON AND SD FOR NIGHT CMT PLUG SPOTTED @ 7940' - TOP OF PLUG @ 7727'; 25 SX CL H CMT PLUG SPOTTED @ 7100' - TOP OF PLUG @ 6887'; 25 SX CL H CMT PLUG SPOTTED @ 5480' - TOP OF PLUG @ 5222'; 75 SX CL A CMT PLUG SPOTTED @ 950' - TOP OF PLUG @ 605'; 100 SX CL A CMT PLUG SPOTTED @ 50' = TOP OF PLUG @ SURFACE; 15 SX CL A
8/10/1995	PLUGGING COMPLETION DATE

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

SEP 03 1985

PERMIT NUMBER

38748

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG OIL & GAS COMPANY 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) INDRIL, INC. PO Box 668 Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT GREIN #1-35						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE 1/4 SE 1/4 NE 1/4		SECTION 35	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 833 Ft. from South		Line and 460		FOOTAGES (East/West) Ft. from East		Line of quarter section COUNTY NAME Osceola	
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		Line and		FOOTAGES (East/West)		Line of quarter section COUNTY NAME	
DATE	DRILLING BEGUN 06/05/85		TOTAL DEPTH OF WELL Driller 8206 Log 8197		TYPE WELL Gas		ELEVATIONS
	DRILLING COMPLETED 06/25/85		FORMATION AT T.O. Cabot Head		FT. DRLD. - ROTARY TOOLS From 0 To 8206		
	WELL COMPLETED 07/29/85		PRODUCING FORMATION(S) Burnt Bluff		FT. DRLD. - CABLE TOOLS From To		
					K.B. 1215.4	R.F. 1214.2	
					R.T.	Grd. 1199	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
16"	642'						YES	NO
11-3/4"	939'	130 Lite, 200 CIA		7/27/85	19	8096-98, 8104-07, 8118-21		
8-5/8"	5508'	1st stage 450 Lite, 200 CIA			4/ft			
DV Tool	3680'	2nd stage 650 Lite, 100 CIA						
5-1/2"	8204'	365 POZ, 175 CIA						

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
Burnt Bluff	Gas	8045	8122				Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Antrim	Gas	3150					X	
				Reed City Dolo	"	4150					X	
				Sour Zone	"	4650					X	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
7/27/85	8096-8121	500 gal. 20% FeHCl	NONE				
7/28/85	8096-8121	500 gal. 20% FeHCl					

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	100-8195			2300	1 1/4			
Birdwell		DLL-MLL	7000-8195			4500	1/2			
						6300	1/2			
						7900	1 1/4			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
			500			

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 8/13/85	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E. Booker</i>
-----------------	--	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☐ CHANGE WELL STATUS ☒ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION / INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

30 MCFD of Gas

WORK TO BE DONE BY: ☐ APPROVAL MAILED

To Be Determined

PERMIT NO.

38748

TYPE OF WELL

Gas

NAME AND ADDRESS OF WELL OWNER ☐ APPROVAL MAILED

Marathon Oil Company  
1231 E. Mosherville Road  
Jonesville, MI 49250

FIELD/FACILITY NAME

Hersey Unit

WELL NAME

Grein

WELL NO.

#1-35

WELL LOCATION

NE 1/4 of SE 1/4 of NE 1/4 Section 35 T 17N R 9W

TOWNSHIP  
Hersey

COUNTY

Osceola

DATE DRILLING COMPLETED  
06-28-85

DATE LAST PRODUCED/UTILIZED  
Active

STARTING DATE

A.S.A.P.

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
22"	16", 65#	642'	760 sx Howco Lite/100 sx Class "A" w/3% CaCl2	Surface	
14 3/4"	11 3/4", 60#	939'	130 sx Howco Lite/200 sx Class "A" w/3% CaCl2	Surface	
10 5/8"	8 5/8", 32#	5508'	*	Surface	
7 7/8"	5 1/2", 20#	8204'	365 sx Howco Poz, 4% gel, 10% salt/175 sx	5630'	8096-98'

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

Class A, 10% salt

8104-07'

8118-21'

\* 1st stage: 450 sx Howco lite w/2% cc + 200 sx Class "A" DV tool @3680'.  
2nd stage: 650 sx Howco lite w/2% cc + 100 sx Class "A" w/3% cc.

See Exhibit "A"

GEOLOGICAL SURVEY

DETAIL PROPOSED PROCEDURES:

MAR 08 1994

See Attachment

Permits & Bonding Unit

DNR ADDITIONAL REQUIREMENTS:

NAME/SIGNATURE (Authorized Representative)  
N.R. Daniels, Jr. Michigan Production Superintendent

*N.R. Daniels, Jr.*

DATE

2/22/94

APPROVED BY DNR

*Michael J. M...*

OFFICE

ADP-12C

APPROVAL DATE

MAR 03 1994

TERMINATION DATE

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.

GREIN 1-35  
Section 35-T17N-R9W  
Osceola County, Michigan

P & A PROCEDURE

WELL DATA:

16" 65# csg @ 642'	Cement to surface
11-3/4" 60# csg @ 939'	Cement to surface
8-5/8" 32# csg @ 5508'	Cement to surface
5-1/2" 20# csg @ 8204'	TOC = 5630' (CBL)
2-7/8" 6.5# tbg @ 7372'	
Existing perfs @ 8096-8121' OA	

PROCEDURE:

1. Notify DNR in Cadillac at (616)775-9727.
2. Kill well with 10.2 ppg SAB (State Approved Brine). ND tree. NU BOP's.
3. TOH with 2-7/8" tubing and packer.
4. RU wireline company. Run gauge ring and junk basket to 8080'. Set cement retainer @ 8075'. TIH with tubing and sting into cement retainer. Establish injection and pump 50 sx of Class "H" cement. Displace 25 sx into formation, pull out of cement retainer and spot 25 sx above retainer. TOH to 7100' and reverse circulate to clean tubing.
5. With tubing at 7100', spot a 25 sx Class "H" cement plug at 7100-6900' (Across top of A2 Carbonate @ 7009'). TOH with tubing.
6. RU wireline company. Run freepoint and cut 5-1/2" casing at freepoint. TOH with 5-1/2" casing. (Monitor for NORM and follow casing handling guidelines if NORM is encountered.)
7. Set 8-5/8" CIBP just above the top of 5-1/2" casing stub or at 5500', whichever is deeper.
8. TIH with 2-7/8" tubing to CIBP. Spot a 75 sx Class "A" cement plug above CIBP. TOH to 950' and reverse circulate to clean tubing.
9. With tubing at 950', spot a 100 sx Class "A" cement plug at 950-600' (Across 11-3/4" and 16" casing shoes). TOH with tubing.
10. Spot a 15 sx Class "A" cement plug at 50' - surface. Cut casing off 4' below ground level. Weld marker plate over top of casing.

CAP 2-15-94  
C. A. Paulson

Pel  
P. E. Legg

N. R. Daniels, Jr.



Permit Number  
38748

Well Name & Number  
GREIN #1-35

## RECORD OF WELL PLUGGING OR REWORK

REQUIRED BY AUTHORITY OF: ACT 61, PA 1939, as amended or ACT 315, PA 1989, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Type of Well Gas

Field Name Hersey Unit

1/4 1/4 1/4, Section, Township, Range  
NE, SE, NE, Section 35-T17N-R9W Osceola County

Date Plugging / Rework Started  
8/7/95

Date Plugging / Rework Completed  
8/10/95

Name and Address of Well OWNER  
MARATHON OIL COMPANY  
4445 E. MOSHERVILLE ROAD  
JONESVILLE, MI 49250

Name and Address of Contractor/Service Company  
(attach additional sheets as needed)  
McConnell & Scully, 26761 L Drive S, Homer, MI 49245  
Halliburton, PO Box 374, Mt. Pleasant, MI 48804

Indicate Operation & Type of Well Permit  
☐ PLUGGING ☐ REWORK ☐ Act 61 Oil & Gas ☐ Act 315 Mineral Wells

Name of DNR employee issuing Plugging Permit or Approving Change of Well Status  
Michael J. Moss Date Issued 3/3/94

☐ Tools, tubing, etc. left in hole - describe in Daily Chronology.

☐ Well logs run - list types and depths in Daily Chronology.

### For WELL PLUGGING Only (HOLE CONDITIONS AFTER PLUGGING)

CASING			
Casing Size	Where Set	Amount Casing Pulled	Depth Casing Cut/Perfed: Windows Milled
16"	642'	4'	4'
11-3/4"	939'	4'	4'
8-5/8"	5508'	4'	4'
5-1/2"	8204'	5500'	5500'

PLUGS				
Depth		Type of Bridge or Plug	Cement Plugs: Cement type, # sx, and additives	Tagged Top? Y/N
Bottom	Top			
7940'	7940'	Cement Retainer		Y
7940'	7727'	Cement	25 sx Class "H"	N
7100'	6889'	Cement	25 sx Class "H"	N
5480'	5480'	Cast Iron BP		Y
5480'	5222'	Cement	75 sx Class "A"	N
950'	605'	Cement	100 sx Class "A"	N
50'	Surf	Cement	15 sx Class "A"	N

Check ☐ if NORM material was reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on back of this form.

### For WELL REWORK Only

REWORK WAS TO: ☐ TEMPORARILY ABANDON  
☐ CONVERT TO: ☐ Disposal Well ☐ Production ☐ Storage ☐ Enhanced Recovery ☐ Other  
☐ REMEDIAL: ☐ Perf & Test ☐ Repair Casing/Cement ☐ Redrill ☐ Other  
☐ PLUGBACK: ☐ New Production Zone ☐ Disposal ☐ Storage ☐ Enhanced Recovery ☐ Other

### Well Casing Record - BEFORE Rework

Casing		Cement		Perforations			Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well Casing Record - AFTER Rework (indicate additions and changes only; complete Test Record on next page)

Casing		Cement		Perforations			Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### BEFORE REWORK

### AFTER REWORK

Total Depth	Formation/Zone	Well Completed For	Total Depth	Formation/Zone	Well Completed For



DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
August 11, 1995

WORKOVER/RECOMPLETION

Hersey Unit  
Grein #1-35  
Osceola County, MI  
AFE NO:  
AFE AMOUNT:

OPERATOR: Marathon Oil  
RIG: McConnell & Scully  
MOC/WI:  
MIRU: 08/04/95

COST TO DATE: \$  
DAY: 4

PRESENT OPERATION: Rigging down, capping well.

REMARKS: 08/10/95: RU A-1 casing service and pull remainder of 5-1/2" casing. ND BOP's and tubing spool, install 8-5/8" cast iron bridge plug on tubing and start in hole, NU BOP's and spool, TIH and set retainer at 5480', sting out of retainer and balance a 75 sx Class A cement plug on top of retainer. TOOH laying down tubing to 4800', where 140 bbls of drilling mud was spotted in hole, tubing was then pulled to 950' where a 100 sx Class A cement plug was spotted. Tubing was pulled from hole and casing was filled to surface with 15 sx Class A cement. BOP's and head were removed from well, RD Halliburton and SD for night.

Cement plug spotted @ 7940' - top of plug @ 7727'  
Cement plug spotted @ 7100' - top of plug @ 6887'  
Cement plug spotted @ 5480' - top of plug @ 5222'  
Cement plug spotted @ 950' - top of plug @ 605'  
Cement plug spotted @ 50' = top of plug @ surface



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

LANSING

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☒ CHANGE WELL STATUS ☐ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☒ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION/INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

50 MCFD of Gas

WORK TO BE DONE BY: ☐ APPROVAL MAILED

To be Determined

PERMIT NO

38748

TYPE OF WELL

NAME AND ADDRESS OF WELL OWNER ☐ APPROVAL MAILED

Marathon Oil Company  
P.O. Box 68  
Jonesville, MI 49250

FEB 10 1992

FEB 10 1992

FIELD/FACILITY NAME

Hersey Unit

WELL NAME

Grein

WELL NO

1-35

WELL LOCATION

NE 1/4 of SE 1/4 of NE 1/4 Section 35 T 17N R 9W

TOWNSHIP

Hersey

COUNTY

Osceola

DATE DRILLING COMPLETED

06-28-85

DATE LAST PRODUCED/UTILIZED

Currently Producing

STARTING DATE

CASING AND CEMENTING RECORD

HOLE DIA	CASING DIA & WT/FT	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT TOP	PERFORATIONS
22"	16", 65#	642'	760 sx Howco lite/100 sx Class A w/3% CaCl		
14-3/4"	11-3/4", 60#	939'	130 sx Howco lite/200 sx Class A w/3% CaCl		
10-5/8"	8-5/8", 32#	5508'	1100 sx Howco lite w/2% CaCl/300 sx Class A		
7-7/8"	5-1/2", 20#	8204'	365 sx Howco poz, 4% gel, 10% salt/		8096-98
FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):			175 sx Class A, 10% salt		8104-07
					8118-21

See Attachment

DETAIL PROPOSED PROCEDURES:

RUSC. Make GR run to 8121'. ROH. RU 2-1/8" thru-tubing perforating guns to shoot 8096'-98', 8104'-07' at 4 spf. RIH and locate guns w/CCL. Once on depth, fire guns. ROH. RDSC. Return well to production.

GEOLOGICAL SURVEY

FEB 27 1992

Permits & Bonding Unit

DNR ADDITIONAL REQUIREMENTS:

NAME/SIGNATURE (Authorized Representative)

N. R. Daniels, Jr., Michigan Production Supt.

DATE

2/3/92

APPROVED BY DNR

Michael J. Moss

OFFICE

APPROVAL DATE

FEB 10 1992

TERMINATION DATE

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-B) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.

PR 7200-B

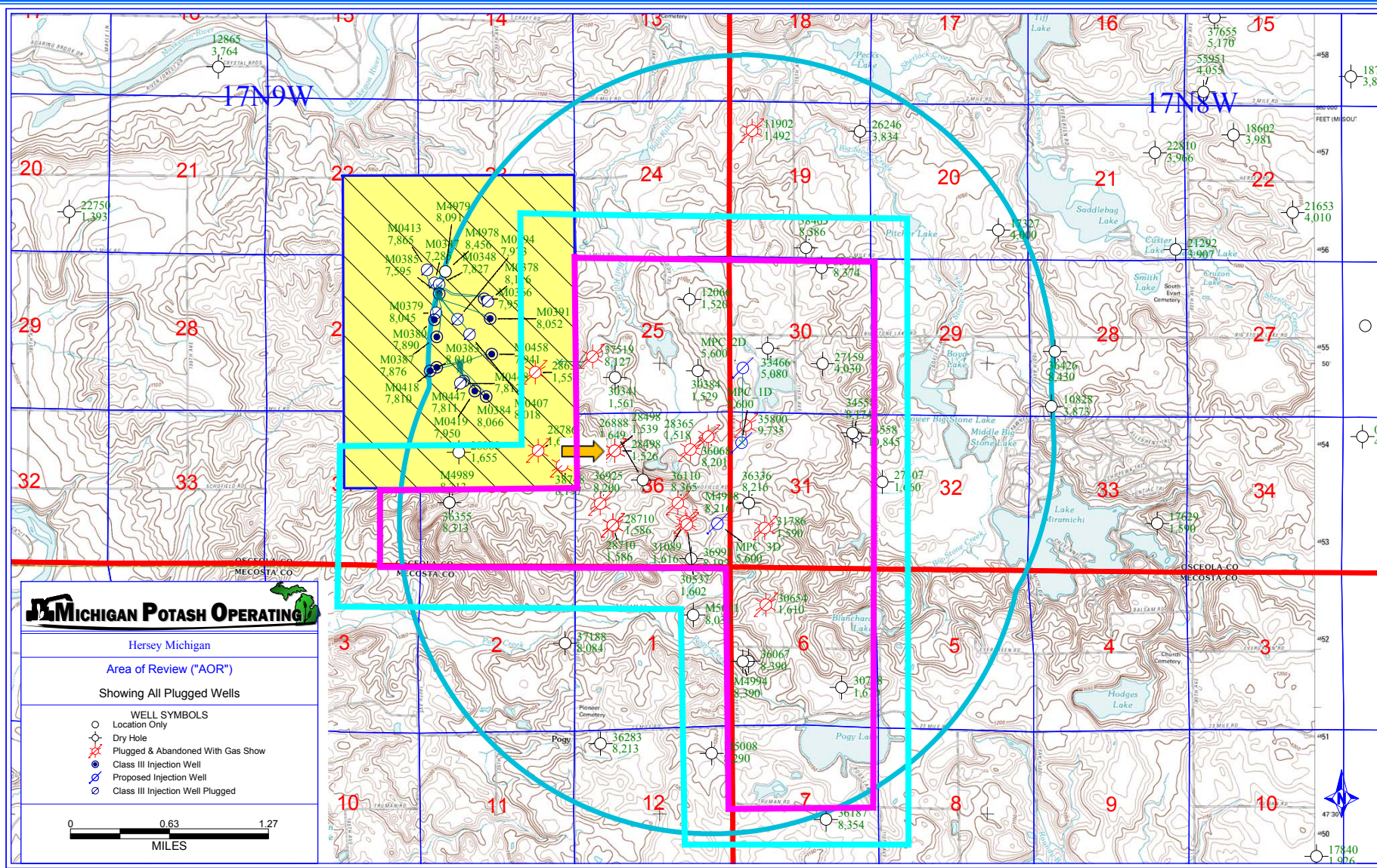
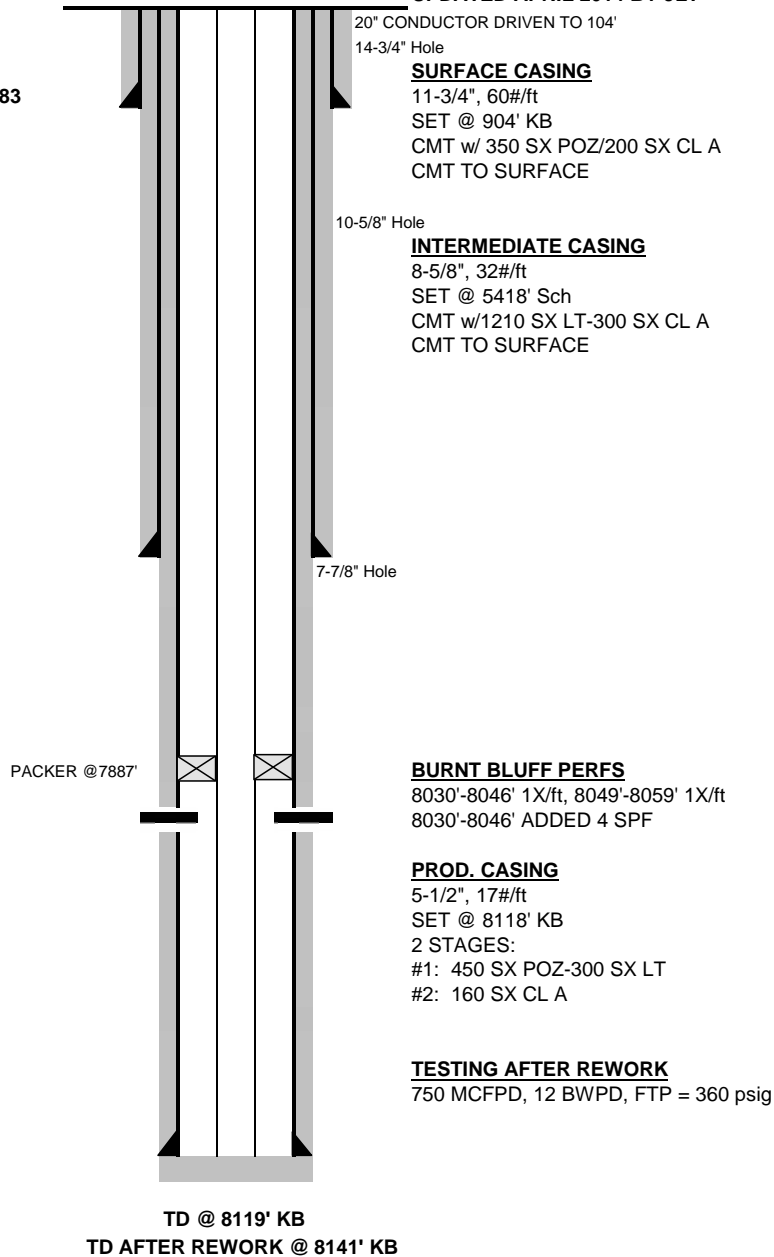


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**GREIN 2-36**  
**SE NW NW Sec 36 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

API No. 21-133-36033-0000  
GL @ 1110'  
KB @ 1127'  
WELL COMPLETION DATE: 11/22/83





### GREIN 2-36 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
7/18/1983	SPUD.
11/22/1983	WELL COMPLETED. FORMATION AT TD CABOT HEAD. PRODUCING FM BURNT BLUFF. 20" SET AT 104', DP 11-3/4" SET AT 904'; 350 SX POZ/200 SX CL A 8-5/8" SET AT 5418'; 1210 SX LT-300 SX CL A 5-1/2" SET AT 8118'; 2 STAGES: #1 425 SX POZ-300 SX LT, #2 160 SX CL A
11/19/1983	PERFORATED 1X/FT: 8030'-8046', 8049'-8059'
11/20/1983	500 GAL. 28% HCl FROM 8030'-8059'
10/7/1991	REWORK STARTING DATE MIRU. SET PLUG IN tbg. ND/NU BOP'S. TESTED BOP'S. RETRIEVED PLUG. KILLED WELL w/10 BBLs SAB. TOH w/2-7/8" tbg. & PACKER. MADE BIT & SCRAPER RUN. TIH w/TCP GUSN, PKR. & 2-3/8" tbg. CORRELATED GUNS w/GR TOOL. SET PKR. AT 7,887'. VERIFIED DEPTH w/GR. FILLED BACKSIDE w/9PPG SAB. ND/NU. TESTED TREE & FLOWLINES. PERFORATED WELL FROM 8,030'-8046' AT 4 SPF. SWABBED WELL & CLEARED SALT RESTRICTIONS. FLOW WELL TO FACILITIES. RDMO.
10/28/1991	REWORK COMPLETION DATE

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

DEC 1 6 1983

PERMIT NUMBER

36033

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG Oil & Gas Co., Inc. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Grein #2-36						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION SE NW NW		SECTION 36	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 460' Ft. from North		LINE AND 835' Ft. from West		COUNTY NAME Osceola			
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		LINE AND		COUNTY NAME			
DATE	DRILLING BEGUN 7-18-83	TOTAL DEPTH OF WELL Driller 8119 Log 8118		TYPE WELL Gas		ELEVATIONS	
	DRILLING COMPLETED 8-12-83	FORMATION AT T.D. Cabot Head		FT. DRILD. - ROTARY TOOLS From 0 To 8119		K.B. 1127	R.F. 1126
	WELL COMPLETED 11-22-83	PRODUCING FORMATION(S)		FT. DRILD. - CABLE TOOLS From To		R.T.	Grd. 1110

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
20"	104'	DP					YES	NO
11 3/4	904'	350 poz/200 C1	A	11-19-83	26x	8030-46 1x/ft	XX	
8 5/8	5418' Sch	1210 sx 1t-300	sx C1 A			8049-59 1x/ft	XX	
5 1/2	8118	425 sx poz-300	1t					
		160 C1 A						

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)				
Burnt Bluff	Gas	8130	8170				Sam- ples	Odor	Pits	Mud Line	Gas Log
				Sunbury	Gas	2600					X
				Antrim	Gas	3100					X
				Sour Zone	Gas	4600					X

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
11-20-83	8030-59	500 gal. 28% HCl	None				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	200-8118			3050	3/4°			
Birdwell		Sonic	200-8118			4600	1°			
		Dual-Micro	2900-8118			5800	1/4°			
						6600	1°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
			1,400			

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 9/13/83	NAME AND TITLE (PRINT) William E. Booker	SIGNATURE <i>William E. Booker</i>
-----------------	---	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77



STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

Filing for change of ownership of well is required in accordance with ☒ Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO 36033	WELL TYPE Gas
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER Grein 2-36	
WELL LOCATION SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SECTION 36 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil & Gas Co., Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by:

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil & Gas Co., Inc., Mr. Donald R. Hall

*Donald R. Hall* 12/14/87

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐ SINGLE WELL

☐ ATTACHED

BONDING CO.

SAFECO Insurance Company of America

☒ BLANKET

☒ ON FILE

BOND NUMBER

5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Mr. David W. Hoopman

*David W. Hoopman*

12/16/87

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*S. J. Szymanski*  
Signature

6/28/88  
Date

DISTRIBUTION BY DNR

- ☒ Lansing
- ☐ Acquiring Owner
- ☐ Selling Owner
- ☐ Field

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

USE APPROPRIATE BLOCKS FOR ITEMS NOT LISTED. SUBMIT ATTACHMENTS  
REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT  
IN FINES AND/OR IMPRISONMENT.

**RECORD OF WELL:** ☐ PLUGGING ☒ REWORK  
(MAIL THREE COPIES TO THE DISTRICT OFFICE WITHIN 30 DAYS AFTER  
COMPLETION OF PLUGGING OR REWORK)

NAME AND ADDRESS OF WELL OWNER

Marathon Oil Company  
1231 E. Mosherville Rd., P.O. Box 68  
Jonesville, MI 49250

PERMIT NO. 36033	TYPE OF WELL Gas
FIELD/FACILITY NAME Hersey - Clinton	
WELL NAME & NUMBER Grein 2-36	
WELL LOCATION SE 1/4 of NW 1/4 of NW 1/4 Section 36 T11N R 9W	
TOWNSHIP Hersey	COUNTY Osceola
TOTAL DEPTH 8,141'	FORMATION Clinton-Burnt Bluff
PLUGGING/REWORK STARTING DATE 10/07/91	PLUGGING/REWORK COMPLETION DATE 10/28/91
TOTAL DEPTH AFTER REWORK 8,141'	MECHANICAL LOGS RUN N/A
WELL COMPLETED FOR Gas	FORMATION AND ZONE Clinton-Burnt Bluff

CASING SIZE	WHERE SET	AMOUNT RECOVERED	SHOT OR RIPPED	TYPE OF BRIDGES OR PLUGS	DEPTH PLACED	SACKS OF CEMENT & ADDITIVES

WERE TOOLS, TUBING, CASING, ETC. LOST OR LEFT IN THE HOLE BEFORE OR  
AFTER PLUGGING? IF YES, GIVE DETAILS.

DID A SERVICE COMPANY PUMP MUD, SPOT CEMENT, OR SET BRIDGE PLUGS?  
IF YES, GIVE NAME AND ADDRESS

WELL PLUGGING/REWORK CONTRACTOR AND ADDRESS

PERMITEE'S PLUGGING WITNESS

NAME(S) OF DNR REPRESENTATIVE WHO

☐ ISSUED PERMIT  
☐ WITNESSED PLUGGING

**WELL CASING RECORD — BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		

**WELL CASING RECORD — AFTER REWORK (Indicate additions and changes only)**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
5-1/2"	8,141'			8,030	8,046		
				(Added 4	spf)		

**GEOLOGICAL SURVEY**

NOV 18 1991

Permits & Bonding Unit

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED OR REWORKED.

MIRU. Set plug in tbg. ND/NU BOP's. Tested BOP's. Retrieved plug. Killed well w/10 bbls.  
SAB. TOH w/2-7/8" tbg. & packer. Made bit & scraper run. TIH w/TCP guns, pkr. & 2-3/8" tbg.  
Correlated guns w/GR tool. Set pkr. at 7,887'. Verified depth w/GR. Filled backside w/9 ppg  
SAB. ND/NU. Tested tree & flowlines. Perforated well from 8,030 - 8,046' at 4 spf. Swabbed  
well & cleared salt restrictions. Flow well to facilities. RDMO.

[illegible]

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☒ CHANGE WELL STATUS ☐ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT

PERMIT NO 36033	TYPE OF WELL Gas
NAME AND ADDRESS OF WELL OWNER <input type="checkbox"/> APPROVAL MAILED Marathon Oil Company 1231 E. Mosherville Rd. P.O. Box 68 Jonesville, MI 49250	
FIELD/FACILITY NAME Hersey-Clinton	
WELL NAME Grein	WELL NO 2-36
WELL LOCATION SE 1/4 of NW 1/4 of NW 1/4 Section 36 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola
DATE DRILLING COMPLETED 08/12/83	DATE LAST PRODUCED/UTILIZED Currently Producing
WORK TO BE DONE BY: <input type="checkbox"/> APPROVAL MAILED To Be Determined	
STARTING DATE 09/15/91	

CASING AND CEMENTING RECORD

HOLE DIA	CASING DIA & WT /FT	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT TOP	PERFORATIONS
	20"	104'	DP		
15"	11-3/4"	904'	350 sx POZ/200 sx Class A		
10-5/8"	8-5/8"	5418'	1210 sx Lite/300 sx Class A		
7-7/8"	5-1/2"	8141'	425 sx POZ/300 sx Lite/160 sx Class A		8030-46'

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc):

	Depth	Shows
Sunbury	2600'	Gas
Antrim	3100'	Gas
Sour Zone	4600'	Gas
Burnt Bluff	8130'	Gas

GEOLOGICAL SURVEY

30  
AUG 28 1991

Permits & Bonding Unit

DETAIL PROPOSED PROCEDURES:

MIRU. Shut in well. Fill 2-7/8" tbg w/Burnt Bluff formation water to kill well. Set plug in hanger. ND tree. NU BOPE. Circulate hole w/9.0 ppg SAB. TOH w/2-7/8" tbg and BHA. TIH w/TCP guns and 2-3/8" tbg. Set pkr. Test backside to 500 psig. Re-perforate well from 8030-8046' @ 4 spf. Flow well to flare. If production rates are unsatisfactory, pump 750 gallons of 15% Fe acid w/additives. Open well to production. RDMO.

DNR ADDITIONAL REQUIREMENTS:

Notify Cadillac District Office, Geological Survey Division, 616/775-9727, 48 hrs. before work is to commence.

NAME/SIGNATURE (Authorized Representative) N. R. Daniels, Jr., Michigan Operations Superintendent		DATE 8/20/91
APPROVED BY DNR <i>Michael J. Nuss</i>	OFFICE Cadillac	APPROVAL DATE 8/28/91
		TERMINATION DATE

NOTE. THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.



## REQUEST FOR TRANSFER OF PERMIT

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

☒ Part 615 Oil/Gas Well☐ Part 625 Mineral Well

Permit number 36033	Well type Gas	Current true vertical depth 8118
Well name and number Grein 2-36		
Surface location SE 1/4 NW 1/4 NW 1/4 Section 36 T 17N R 9W		
Township Hersey		County Osceola

NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13)  
This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.

## TRANSFER OF A PERMIT FROM:

Name(s) of Selling Permittee(s) Marathon Oil Company	Fed. I.D.# or S.S.# 25-1410539		
Address: Number and Street, City or Town, State, ZIP Code Telephone 7301 NW Expressway Oklahoma City, OK. 73132 (405) 720-7373			
All permits rights and responsibilities are discharged by:			
Marathon Oil Company Permittee	Charles A. Paulson Authorized representative name	 Signature	5/18/00 Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date

## TRANSFER OF A PERMIT TO:

Name(s) of Acquiring Permittee(s): RSEC, L.L.C.	Fed. I.D.# or S.S.# 84-1533899		
Address: Number and Street, City or Town, State, ZIP Code Telephone 1200 17th Street, Suite 2350 Denver, CO 80202 (303) 892-5616			
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <input type="checkbox"/> Blanket <input type="checkbox"/> On File Bond Number Pending Amount <input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
RSEC, L.L.C. Permittee	Steve Swanson, MANAGER Authorized representative name	 Signature	5/18/00 Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date

## FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY

Approved Signature	MAY 31 2001 Date	Distribution by DEQ <input checked="" type="checkbox"/> LANSING <input type="checkbox"/> SELLING OWNER <input type="checkbox"/> FIELD <input type="checkbox"/> ACQUIRING OWNER
-----------------------	---------------------	--





## REQUEST FOR TRANSFER OF PERMIT

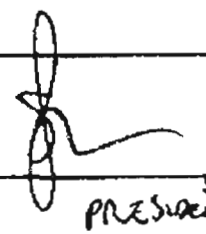
Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

☒ Part 615 Oil/Gas Well☐ Part 625 Mineral Well

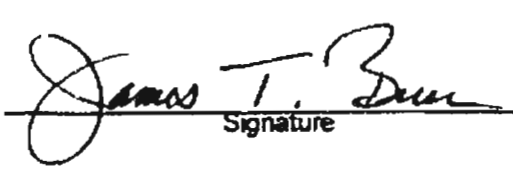
Permit number 36033	Well type Gas	Current true vertical depth 8118
Well name and number Grein 2-36 et al		
Surface location SE 1/4 NW 1/4 NW 1/4 Section 36 T 17N R 9W		
Township Hersey		County Osceola

NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13). This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.

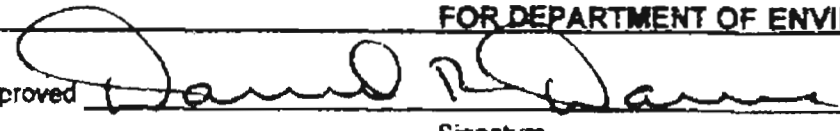
## TRANSFER OF A PERMIT FROM:

Name(s) of Selling Permittee(s) RSEC, L.L.C.		Fed. I.D.# or S.S.# 84-1533899	
Address: Number and Street, City or Town, State, ZIP Code Telephone 1200 17th Street, Suite 2350 Denver, CO 80202		(303) 892-5616	
All permits rights and responsibilities are discharged by:			
RSEC, L.L.C. Permittee	Steve Swanson Authorized representative name	 Signature	8/15/02 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

## TRANSFER OF A PERMIT TO:

Name(s) of Acquiring Permittee(s): Whiting Petroleum Corporation		Fed. I.D.# or S.S.# 84-0918829	
Address: Number and Street, City or Town, State, ZIP Code 1700 Broadway, Suite 2300 Denver, CO 80290-2300		Telephone (303) 837-1661	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <u>Travelers Casualty Surety Co.</u> <input checked="" type="checkbox"/> Blanket <input checked="" type="checkbox"/> On File Bond Number <u>103847277</u> Amount <u>\$250,000</u> <input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
Whiting Petroleum Corporation Permittee	James T. Brown Authorized representative name	 Signature	8-15-02 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

## FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY

Approved  Signature	NOV 25 2002 Date	Distribution by DEQ <input type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner
---	---------------------	---

PERMITS &amp; BONDING



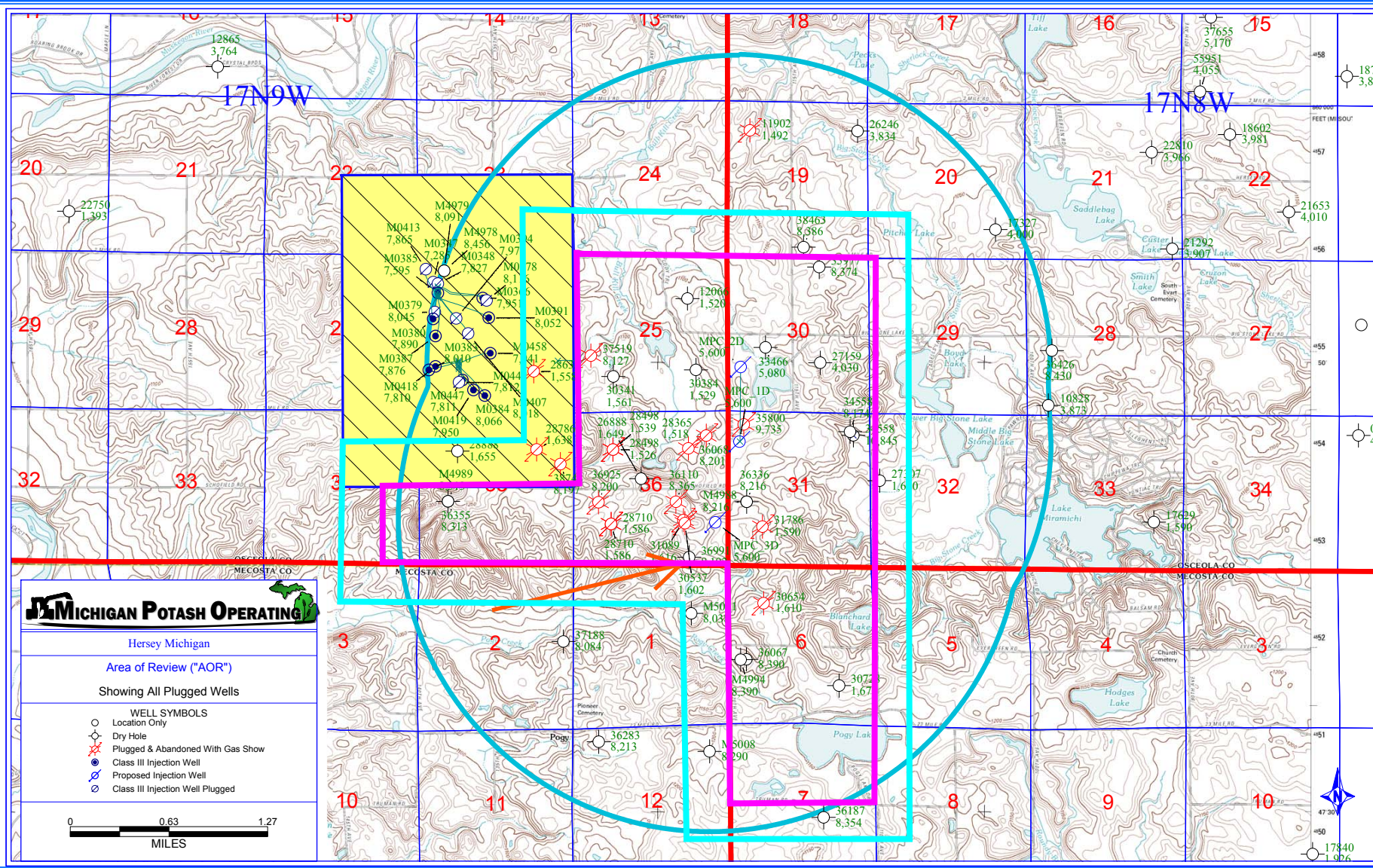
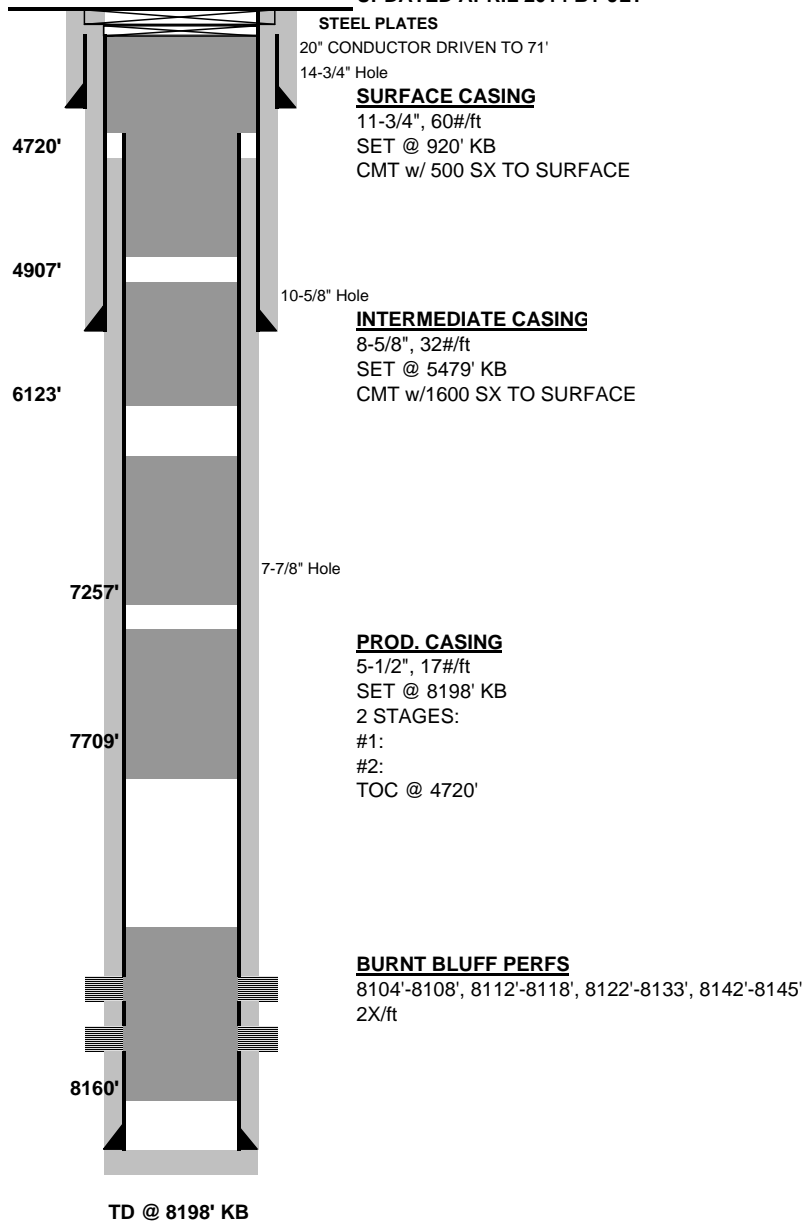


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**HODGES 1-36**  
**SE SW SE Sec 36 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

API No. 21-133-36991-0000  
GL @ 1164.2'  
KB @ 1180.4'  
WELL COMPLETION DATE: 12/21/83  
PLUGGING COMPLETION DATE: 9/9/85



### HODGES 1-36 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
9/13/1983	SPUD.
12/21/1983	WELL COMPLETED. FORMATION AT TD CABOT HEAD. PRODUCING FM BURNT BLUFF. 20" SET AT 71', DP 11-3/4" SET AT 920'; 500 SX 8-5/8" SET AT 5479'; 1600 SX 5-1/2" SET AT 8198', CMT TOP AT 4720'
12/3/1983	PERFORATED 2X/FT:8104'-8108', 8112'-8118', 8122'-8133', 8142'-8145'
12/4/1983	3000 GAL. 20% HCI FROM 8104'-8145'
9/9/1985	PLUGGING STARTED HOLE WAS LOADED WITH 65 BBLS OF 11# BRINE. WELLHEAD WAS REMOVED AND BOPE INSTALLED. BAKER LOK-SET PACKER WAS RELEASE AND TUBING PULLED. TIH and spot 50 SX A at 8160 and squeeze. Spot 50 SX A at 7709. Spot 75 SX LITE at 7257, spot 65 SX light at 6123. Cut 5 1/2 at 4528. TRIPPED IN HOLE OPEN ENDED TO 4907', TAGGED CEMENT. SPOTTED 100 SX @ 4907', 140 SX @ 4052', 140 SX @ 3212', 140 SX @ 2397', 140 SX @ 1562', 80 SX @ 752', 50 SX CLASS A @ 187'. CUT OFF AND CAPPED 11-3/4" & 8-5/8" PIPE 3' BELOW GROUND.
9/9/1985	PLUGGING COMPLETED



FEB 15 1984

## LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)

Submit in DUPLICATE Within 30 Days after Well Completion

PERMIT NUMBER

36991

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG Oil & Gas Co., Inc. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Company 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Hodges #1-36				DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input type="checkbox"/>			
SURFACE LOCATION SE SW SE		SECTION 36	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 267 Ft. from South		Line and 1306		FOOTAGES (East/West) Ft. from West		COUNTY NAME Osceola	
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South) Ft. from		Line and		FOOTAGES (East/West) Ft. from		COUNTY NAME	
DRILLING BEGUN 9-13-83		TOTAL DEPTH OF WELL Driller 8198 Log 8192		TYPE WELL T & A		ELEVATIONS	
DRILLING COMPLETED 10-16-83		FORMATION AT T.D. Cabot Head		FT. DRILD. - ROTARY TOOLS From 0 To 8198		K.B. 1180.4 R.F. 1179.2	
WELL COMPLETED 12-21-83		PRODUCING FORMATION(S) Burnt Bluff		FT. DRILD. - CABLE TOOLS From To		R.T. Grd. 1164.2	

## CASING, CASING LINERS AND CEMENTING

## PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
20"	71'	D.P.					YES	NO
11 3/4"	920'	500 sx		12-3-83	2x/ft	8104-08	X	
8 5/8"	5479	1600 sx				8112-18	X	
						8122-33	X	
						8142-45	X	

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)				
Burnt Bluff	Gas	8109	8134	Antrim	Gas	3126	Sam- ples	Odor	Pits	Mud Line	Gas Log
				Reed City	Gas	4100				XX	

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
12-4-83	8104-8145	3000 gal. 20% H Cl	NONE				

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	XX	LDT-CNL-GR	200-8192			1450	1/2°			
Birdwell		DLL-MLL	3000-8192			3250	1°			
O-TIME		BHC-Sonic	200-8192			6900	1°			
						7920	2°			

## PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 12/1/83	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E. Booker</i>
-----------------	--	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77



STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

APR 26 1988

Filing for change of ownership of well is required in accordance with ☒ Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO	WELL TYPE
36991	Dry Hole
FIELD NAME	
Hersey-Clinton	
WELL NAME AND NUMBER	
Hodges 1-36	
WELL LOCATION	
SE 1/4 SW 1/4 SE 1/4 SECTION 36	T 17N R 9W
TOWNSHIP	COUNTY
Hersey	Osceola

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil & Gas Co., Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by:

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil & Gas Co., Inc., Richard M. Rompala

*Richard M. Rompala* 3/31/88

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐

SINGLE WELL

☐

ATTACHED

BONDING CO. SAFECO Insurance Company of America

☒

BLANKET

☒

ON FILE

BOND NUMBER 5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Donald R. Hall

*Donald R. Hall* 3/28/88

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*S. G. Lyngby*  
Signature

6/20/88  
Date

DISTRIBUTION BY DNR

- ☒ Lansing
- ☐ Acquiring Owner
- ☐ Selling Owner
- ☐ Field

DEPARTMENT OF GEOLOGICAL SURVEY  
PERMIT TO  
SEP 30 1985

**FULL NAME**  
Hersey

LEASE NAME AND WELL NO.

Hodges #1-36

LOCATION (to to to of other)

SE SW SE,

## SECTION

36

17N 9W

**TOWNSHIP**

Hersey

**COUNTY**

## Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry hole

DATE COMPLETED

12/21/83

DATE PLUGGING WILL START

a.s.a.p.

PLUGGING PERMIT REQUESTED BY &amp; DATE

Don Smith

**LAST PRODUCTION**

**BOPO**

**BWFO**

**MC-FG-PD**

**DATA**

**PLUGGING TO BE DONE BY**

will notify

PERMIT MAILED TO

COPIES MAILED TO

### CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP.	PERFORATIONS
	20"	71'	DP		8104-08
	11-3/4"	920'	500	circ1	8112-18
	8-5/8"	5479'	1600	circ1	8122-33
	5-1/2"	8198'		4720	8142-45

**GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:**

## PLUMBING REQUIREMENTS\*

Flagging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

Release pkr., pump 10 sx cmt, reset packer & squeeze. Freept. and pull 5½" csg. about 4700'. Spot 850 sx lite cmt. & 45 sx C1 A for fill up. Cut csg. 3' below grd level & cap w/cmt. & steel plate.

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAY HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 188 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 480.701 to 480.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

**OFFICE**

Cadillac D#6

DATE \_\_\_\_\_

9/25/85

NOTE WELL PLUDDING RECORD Form A-7213 to be filed in TRIPPLICATE within 30 days after completion

14-00000  
 14-00000

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

CADILLAC HAS COPY

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER  
36991

FIELD NAME  
Hersey

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc. 2258 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

Hodges

WELL NUMBER

1-36

WELL LOCATION

SE 1/4 SW 1/4 SE 1/4 SEC. 36 T. 17N R. 9W

TOWNSHIP

Hersey

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole

TOTAL DEPTH

8198'

FORMATION

Cabot Head

DATE PLUGGING STARTED

9-9-85

DATE PLUGGING COMPLETED

9-9-85

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT

~~XXXXXXXXXX~~  
Jack Snider

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
20"	71'	nil	--
11 3/4"	920'	nil	--
8 5/8"	5479'	nil	--
5 1/2"	8198'	4509	shot

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
cement	8160', 7709'	50 sx
	7257', 6123'	75 sx
	4907'	100 sx
	4052', 3212'	140 sx
	2397', 1562'	140 sx
	752'	80 sx
	187'	50 sx Class A

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Slim Cookingham

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED Hole was loaded with 65 bbls of 11# brine. Wellhead was removed and BOPE installed. Baker lok-set packer was released and tubing pulled. Laid down packer and ran in open end tubing to 8160'. Spot 50 sx Class A with .3 of 1% He4. Squeeze for 1 hr. at 400#. Spot 50 sx Class A with .3 of 1% He4 at 7709. 75 sx HOWCO Lite @ 7257'. 75 sx HOWCO Lite @ 6123'. Cut 5 1/2" casing @ 4528 KB, recovered 4509'. Tripped in hole open ended to 4907', tagged cement. Spotted 100 sx @ 4907', 140 sx @ 4052', 140 sx @ 3212', 140 sx @ 2397', 140 sx @ 1562', 80 sx @ 752', 50 sx Class A @ 187'. Cut off and capped 11 3/4" & 8 5/8" pipe, 3' below ground.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

Donald P. Smith

COMPANY NAME AND ADDRESS

PPG Oil & Gas Co., Inc.  
2258 Enterprise Drive  
Mt. Pleasant, MI 48858

SIGNATURE

*[Signature]*

DATE (Month, Day, Year)

9-24-85



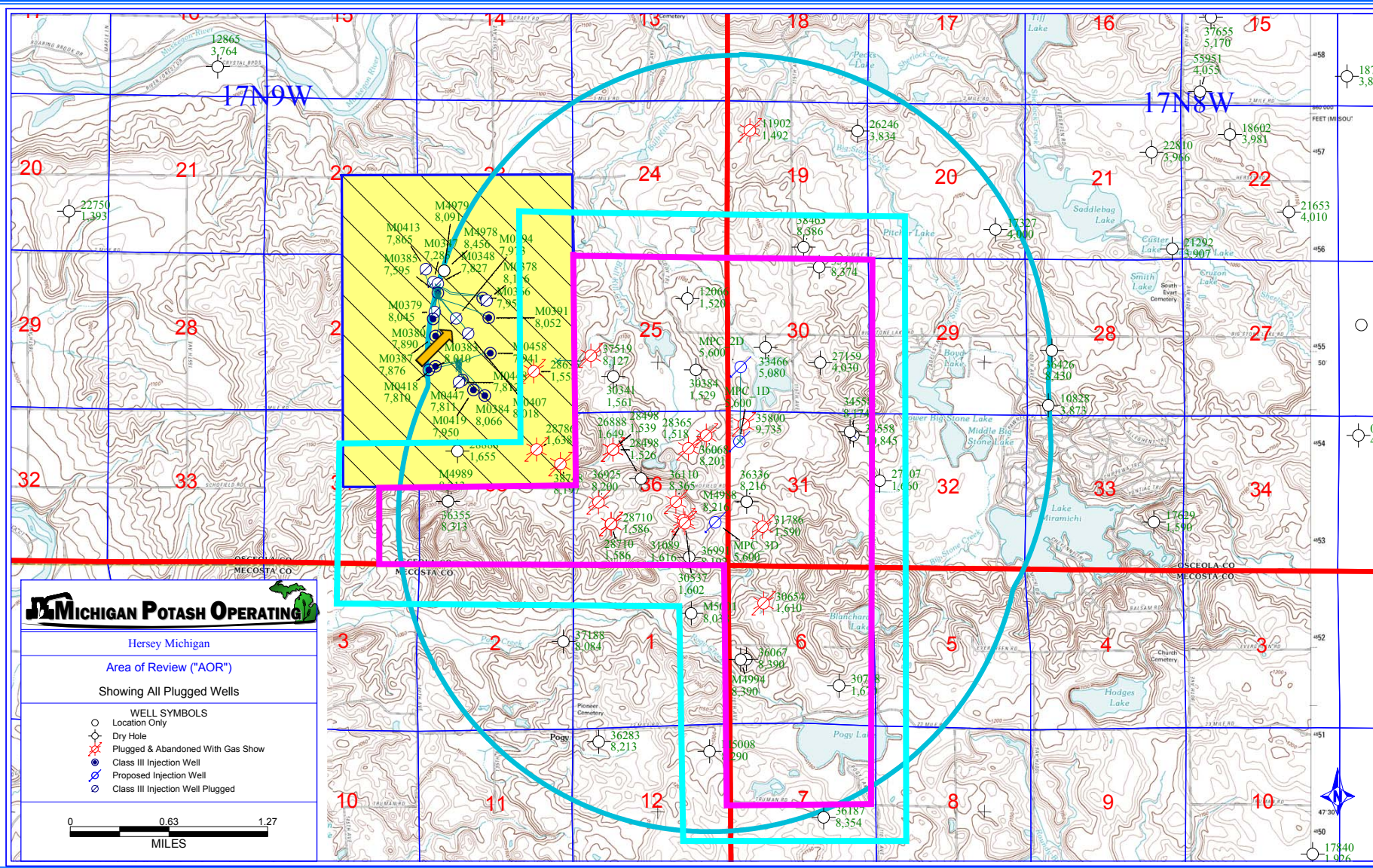
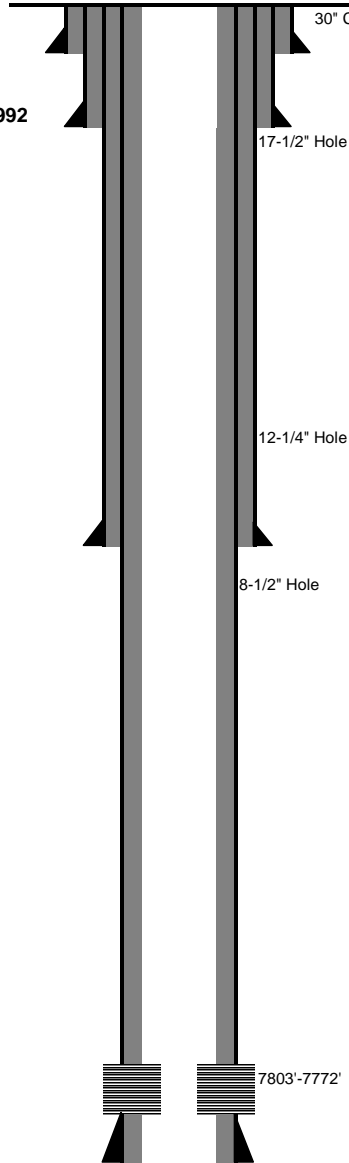


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**KALIUM 1031**  
SW NW NW Sec 26 T17N R9W  
OSCEOLA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

PERMIT No. 00381  
API No. 21-133-00381-70-00  
GL @ '  
KB @ '  
WELL COMPLETION DATE:  
PLUGGING COMPLETION DATE: 2/9/1992

UPDATED APRIL 2014 BY JLT



**SURFACE CASING**

13 3/8", 54#/ft  
SET @ 904'  
TD @ 4800

**SURFACE CASING**

18-5/8"  
SET AT 460'; 750 SX LITE A

**INTERMEDIATE CASING**

13-3/8"  
SET AT 820'; 575 SX LITE A

**INTERMEDIATE CASING**

9-5/8", 40#/ft  
SET AT 5205'; 2325 SX LITE A

**PROD. CASING**

7", 26#/ft  
SET AT 7862'; 530 SX LITE A; PERFED 7803-7772 AT 4 SH/FT  
**TD AFTER REWORK @ 7862'**

**PLUGGING**

SET 3079 SX CLASS A CMT FROM 800'-4800' IN 5 STAGES.  
SET 458 SX POZMIX CMT FROM SURFACE TO 800'.  
CUT 13-3/4' CASING 3' BELOW GROUND LEVEL.  
CAPPED WITH 1/2" STEEL PLATE.

**REWORK COMMENCED**

18-5/8" SET AT 460'; 750 SX LITE A  
13-3/8" SET AT 820'; 575 SX LITE A  
9-5/8" SET AT 5205'; 2325 SX LITE A  
7" SET AT 7862'; 530 SX LITE A; PERFED 7803-7772 AT 4 SH/FT  
TD AFTER REWORK @ 7862'  
TRIP 4-1/2" OUT OF HOLE STANDING. REPLACE 4-1/2" PIPE. RUN IN INJ.  
LINER PFC. LAND BOTTOM AT 7775 INJ. POINT. 7767 BY PFC.  
REWORK COMPLETED.

**REWORK COMMENCED.**

DETERMINED WE HAD A HOLE IN 7" CASING. RAN A PACKER IN THE  
HOLE TO DETERMINE THE DEPTH OF THE HOLE.  
PULLED 7" CASING AND CUT AND DRESSED 7" CASING. RAN 7" CASING  
PATH AND PATCHED CASING AT 1030'.  
REWORK COMPLETED.

**AFTER REWORK TD @ 7862'**  
**TD @ 4800'**



**KALIUM 1031 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
2/9/2009	SPUD. DRILLING COMPLETED.  13 3/8" SET AT 904';
2/8/1992	PLUGGING START DATE SET 3079 SX CLASS A CMT FROM 800'-4800' IN 5 STAGES. SET 458 SX POZMIX CMT FROM SURFACE TO 800'. CUT 13-3/4' CASING 3' BELOW GROUND LEVEL. CAPPED WITH 1/2" STEEL PLATE.
4/25/1997	REWORK COMMENCED 18-5/8" SET AT 460'; 750 SX LITE A 13-3/8" SET AT 820'; 575 SX LITE A 9-5/8" SET AT 5205'; 2325 SX LITE A 7" SET AT 7862'; 530 SX LITE A; PERFED 7803-7772 AT 4 SH/FT TD AFTER REWORK @ 7862' TRIP 4-1/2" OUT OF HOLE STANDING. REPLACE 4-1/2" PIPE. RUN IN INJ. LINER PFC. LAND BOTTOM AT 7775 INJ. POINT. 7767 BY PFC.
4/29/1997	REWORK COMPLETED.
7/6/2004	REWORK COMMENCED. DETERMINED WE HAD A HOLE IN 7" CASING. RAN A PACKER IN THE HOLE TO DETERMINE THE DEPTH OF THE HOLE. PULLED 7" CASING AND CUT AND DRESSED 7" CASING. RAN 7" CASING PATH AND PATCHED CASING AT 1030'.
7/11/2004	REWORK COMPLETED.

**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994 as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

☐ Part 615 Oil/Gas Well      ☒ Plugging  
☒ Part 625 Mineral Well      ☐ Change of Well Status

Name and address of contractor/service company Mosaic Potash Hersey 1395 135 <sup>th</sup> Ave Hersey, Mi 49639		Type of well Solution Mining	Field name Kalium (Mosaic Potash)	
		Surface location SW 1/4    SE 1/4    NW 1/4    Sec 26    T 17 N    R 9 W		
		Township Hersey	County Osceola	
		Date plugging/change started 10/15/2009	Date plugging/change completed 10/22/2009	
DEQ employee issuing plugging permit or approving Change of Well Status Raymond Vugrinovich			Date issued 3/8/2009	
Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse				

WELL PLUGGING (Hole conditions after plugging)							
CASING							
Casing size		Where set	Amount casing pulled	Depth casing cut/perfed, or windows milled			
18 5/8"		460'	0				
13 3/8 "		820'	0				
9 5/8 "		5205'	0				
7 "		7862'	4820'				
PLUGS							
Depth of plug Bottom      Top		Make and type of bridge or plug	Cement plugs: type amount of cement & mix water	Additives type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N
6100'	5554'	CIBP	100 Sacks Class A	None	FW/41.2 BBL	24 Hrs	Y
5244'	4478'		150 Sacks Class A	None	FW/33 BBL	0	N
4478'	3978'		175 Sacks of 50/50 Poz	None	FW/29.5 BBL	0	N
3978'	3478'		175 Sacks of 50/50 Poz	None	FW/25.8 BBL	0	N
3478'	2978'		175 Sacks of 50/50 Poz	None	FW/22.0 BBL	0	N
2978'	2478'		175 Sacks of 50/50 Poz	None	FW/18.3 BBL	0	N
2478'	1978'		175 Sacks of 50/50 Poz	None	FW/14.6 BBL	0	N
1978'	1478'		175 Sacks of 50/50 Poz	None	FW/10.9 BBL	0	N
1478'	978'		175 Sacks of 50/50 Poz	None	FW/7.2 BBL	0	N
978'	478'		175 Sacks of 50/50 Poz	None	FW/3.8 BBL	0	N
478'	300'		64 Sacks of 50/50 Poz	None	FW/1.3 BBL	0	N
<input type="checkbox"/> Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse. <input type="checkbox"/> Check if cores were taken and attach core descriptions							

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well.

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

**RECEIVED**

NOV 17 2009

COMPLETE BOTH SIDES

**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994 as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

- ☐ Part 615 Oil/Gas Well      ☒ Plugging  
☒ Part 625 Mineral Well      ☐ Change of Well Status

Permit number 394-855-767	Well name and number Kalium 1031 (Mosaic Potash)
API number MI-133-3G-A002	
Name and address of permittee Mosaic Potash Hersey 1395 135 <sup>th</sup> Ave Hersey MI 49639	

Name and address of contractor/service company Mosaic Potash Hersey 1395 135 <sup>th</sup> Ave Hersey, MI 49639	Type of well Solution Mining	Field name Kalium (Mosaic Potash)
	Surface location SW 1/4 SE 1/4 NW 1/4 Sec 26 T 17 N R 9 W	
	Township Hersey	County Osceola
	Date plugging/change started 10/15/2009	Date plugging/change completed 10/22/2009
	DEQ employee issuing plugging permit or approving Change of Well Status Raymond Vugrinovich	

Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse.

**WELL PLUGGING**  
(Hole conditions after plugging)**CASING**

Casing size	Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled
18 5/8"	460'	0	
13 3/8 "	820'	0	
9 5/8 "	5205'	0	
7 "	7862'	4820'	

**PLUGS**

Depth of plug Bottom      Top		Make and type of bridge or plug	Cement plugs: type, amount of cement & mix water	Additives type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N
300'	Surface		108 Sacks of Class A	None	0		
				None			
				None			
				None			
				None			
				None			
				None			
				None			
				None			
				None			

- ☐ Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse.  
☐ Check if cores were taken and attach core descriptions

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well.

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

**RECEIVED**

NOV 17 2009

COMPLETE BOTH SIDES

API number MI-133-3G-A002	Permit number 394-855-767
------------------------------	------------------------------

### CHANGE OF WELL STATUS

Change was to: <input type="checkbox"/> Convert current zone to: <input type="checkbox"/> Production <input type="checkbox"/> Disposal <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Storage <input type="checkbox"/> Other _____	<input type="checkbox"/> Remediate well: <input type="checkbox"/> Perf and test existing zone <input type="checkbox"/> Repair casing/cement <input type="checkbox"/> Other _____	<input type="checkbox"/> Plugback (recomplete as) <input type="checkbox"/> New production zone <input type="checkbox"/> Disposal <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Storage <input type="checkbox"/> Other _____	<input type="checkbox"/> Redrill: <input type="checkbox"/> Horizontal drain hole <input type="checkbox"/> Collapsed casing <input type="checkbox"/> Underream open hole <input type="checkbox"/> Other _____
---	---	---	--

#### Well casing record - BEFORE change

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

#### Well casing record - AFTER change (Indicate additions and changes only, complete test record)

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

#### BEFORE CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

#### AFTER CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

#### DAILY PRODUCTION TEST RECORD

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure	
				Tubing	Casing

#### DAILY INJECTION TEST RECORD ☐ Injection well ☐ Brine disposal

Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
		Beginning	Ending	

RECEIVED

NOV 17 2009

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

### DAILY CHRONOLOGY

Describe in detail the daily chronology of change/plugging, include days shut down. Describe exceptions to issued plugging instructions. Describe tools, tubing, etc left in hole and any logs run. Include dates pits filled, surface restored, etc. Use additional pages as needed.

Date	Narrative
5/20/09	Set Big Boy CIBP.
10/15/09	Set 100 sks of Class A @ 6088' Wait on cement and tag on 10/21/2009 @ 5400'
10/21/09	Set 150 sks of Class A @ 5244' and cement up the 7" and into the 9 5/8" at the 7" cutoff point of 4820'
10/22/09	Set 175 sks of 50/50 Poz @ 4478' @ 3978' @ 3478' @ 2978' @ 2478' @ 1978' @ 1478' @ 978' Set 64 sks of 50/50 Poz @ 478' and set 108 sks of Class A @ 300'. Had cement to surface
10/23/200	Cut off wellhead 4' below grade and weld a cap on the 9 5/8" stub

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended, a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION: I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (printed or typed) William Hicks (Minefield Supervisor)	Authorized signature 	Date 11/4/2009
---	--------------------------	-------------------

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.



## MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

## APPLICATION TO:

- ☐ CHANGE WELL STATUS OR  
☒ PLUG AND ABANDON WELL

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment

☐ Part 615 Oil or Gas Well

☒ Part 625 Mineral Well

Change of well status requested to:

- ☐ Plug back ☐ Perforate ☐ Temporarily abandon  
☐ Convert to ☐ Other P & A

Last production/injection rate and type of fluid

Brief description of project

Set CIBP @ 6100'-Set 100 Sack Class A plug-Cut and Pull 7" Casing- Cement continuous 50/50 poz plugs to 300' and set Class A plug to surface. Cut off wellhead and cap.

Work to be done by

Mosaic Potash Hersey

Permit number

394-855-767

Type of well

Solution Mining

API number

MI-133-3G-A002

Name and address of permittee

Mosaic Potash Hersey  
1395 135<sup>th</sup> Ave

Hersey, Michigan 49639

Well name and number

Kalium 1031 (Mosaic Potash)

Well location

SW 1/4 of NW 1/4 of NW 1/4 Section 26 T 17N R 9W

Township

Hersey

County

Osceola

Date drilling completed

10-14-94

Date last produced/utilized

3/13/2007

Starting date

5/1/2009

## CASING AND CEMENTING RECORD

Hole dia	Casing dia & wt/ft	Depths set	Cement quantity, type, additives	Cement top	Perforations
24"	18 5/8" 87#	460'	750 Sacks Lite A	Surface	
17 1/2"	13 3/8" 54#	820'	575 Sacks Lite A	Surface	
12 1/4"	9 5/8" 40#	5205'	2325 Sacks Lite A	Surface	2224-2228'
8 1/2"	7" 23 & 29#	7862'	530 Sacks H	5600'	7772-7803'

Formation record (formation and depth of top, oil, gas and water shows, etc.):

formation

depth

Detail proposed procedures:

Set CIBP @ 6100'- Set 100 sack Class A plug @ 6100'. Run Free point tool and determine free 7" casing. Cut and pull 7" casing laying down. Set continuous 215 Sack plugs of 50/50 poz from 7" cut off depth to 300'. Set 115 Sack plug of Class A cement from 300' to surface Cut off wellhead and cap 9 5/8" casing.

Name/signature (authorized representative):

Date:

3/20/2009

FOR OFFICE OF GEOLOGICAL SURVEY USE ONLY

DEQ additional requirements:

NOTIFY MARK SMITH (231-876-4434) AND RAY VIGRINOVICH (517 241 1532) NO LATER THAN 72 HOURS BEFORE PLUGGING STARTS. LIQUID RECOVERED DURING PLUGGING MAY BE DISPOSED IN THE WOODWARD OR THOMAS DISPOSAL WELLS.

RECEIVED

MAR 31 2009

☐ Yes ☐ No ☒ Not applicable Production tests to commence within 10 days of completion and to be filed

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

☒ Yes ☐ No Service company records are to be filed

Approved by DEQ:

Raymond Vignovich

Office:

LANSING

Approval date:

3/8/2009

Termination Date:

3/8/2010

Submit original and three (3) copies of this application to the District Office within 60 days of change of well status  
Note: Three copies of Record of Well Plugging or Change of Well status (EQP 7200-8) and any requested service company records are to be filed within 60 days of completion at the District Office



## APPLICATION TO:

- ☐ CHANGE WELL STATUS OR  
☐ PLUG AND ABANDON WELL

Permit number

394-855-767

API number

MI-133-3G-A002

Well name and number

Kalium 1031 (Mosaic Potash)

Continuation of proposed procedures

RECEIVED

MAR 31 2009

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

**REQUEST FOR TRANSFER OF PERMIT**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.


☐ Part 615 Oil/Gas Well☒ Part 625 Mineral Well

Permit number M-394	Well type Brine Prod.	Current true vertical depth 7586
Well name and number Kalium Hersey 1031		
Surface location SW 1/4 NW 1/4 NW 1/4 Section 26 T 17N R 9W		
Township Hersey		County Osceola


NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13)

**This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.**

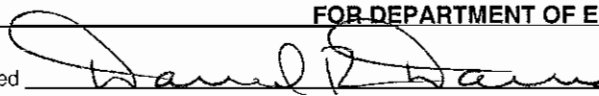
**TRANSFER OF A PERMIT FROM:**

Name(s) of Selling Permittee(s) Kalium Chemicals, Limited		Fed I.D.# or S.S.# 38-3545577	
Address: Number and Street, City or Town, State, ZIP Code Telephone 1395, 135th Avenue Hersey, MI, 49639		231-832-3755	
All permits rights and responsibilities are discharged by:			
Kalium Chemicals, Limited Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date


**TRANSFER OF A PERMIT TO:**

Name(s) of Acquiring Permittee(s): IMC Potash Hersey Inc.		Fed I.D.# or S.S.# ME0132184	
Address: Number and Street City or Town State ZIP Code 1395, 135th Avenue Hersey, MI, 49639		Telephone 231-832-3755	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling operation, and abandonment in conformity with the law, regulations and orders			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <u>Royal Bank of Canada</u>			
<input checked="" type="checkbox"/> Blanket <input checked="" type="checkbox"/> On File Bond Number <u>P43087C00008</u> Amount <u>\$25,000</u>			
<input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
IMC Potash Hersey Inc Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY**


Approved  Signature	MAY 08 2001 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner
---	---------------------	--

RECEIVED

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY						FEB 04 1999																																																																																																					
WASHINGTON, DC 20460				WELL REWORK RECORD		GEOLOGICAL SURVEY DIV. ENVIRONMENTAL QUALITY																																																																																																					
EPA																																																																																																											
NAME AND ADDRESS OF PERMITTEE IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639				NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639																																																																																																							
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT - 640 ACRES				STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002	M:394 <del>MI-133-3G-A002</del>																																																																																																				
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 100px;"> <tr><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: -20px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -20px; top: 50%; transform: translateY(-50%);">E</div>				X																																																																																																				SURFACE LOCATION DESCRIPTION SW 1/4 of NW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1314 ft from (N/S) N Line of quarter section and 650 ft. from (E/W) W line of quarter section			
				X																																																																																																							
WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework 7862		TYPE OF PERMIT Individual																																																																																																							
Lease Name		Total Depth After Rework 7862		X Area																																																																																																							
		Date Rework Commenced 10/28/98		Number of Wells 17																																																																																																							
		Date Rework Completed 1/10/99		Well Number 1031																																																																																																							
WELL CASING RECORD - BEFORE REWORK																																																																																																											
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																																																					
Size	Depth	Sacks	Type	From	To																																																																																																						
30	80	DRIVEN																																																																																																									
18-5/8	460	750	LITE A																																																																																																								
13-3/8	820	575	LITE A																																																																																																								
9-5/8	5205	2325	LITE A																																																																																																								
7	7862	530	LITE A	7803	7772	4 SH/FT																																																																																																					
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																																																																											
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																																																					
Size	Depth	Sacks	Type	From	To																																																																																																						
30	80	Driven																																																																																																									
18-5/8	460	750	LITE A																																																																																																								
13-3/8	820	575	LITE A																																																																																																								
9-5/8	5205	2325	LITE A																																																																																																								
7	7862	530	LITE A																																																																																																								
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type																																																																																																							
				Log Types		Logged intervals																																																																																																					
Pull THL standing. Separated above 3CM. Fish THL. Recovered																																																																																																											
8jnts of 12jnts. Run Mill. Mill to 7822'. Trip laying. Rerun THL.																																																																																																											
Land at 7788'.																																																																																																											
CERTIFICATION																																																																																																											
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. CFR 144.32).																																																																																																											
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor				SIGNATURE 		DATE SIGNED 02/01/99																																																																																																					

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON DC 20460																																																																																																								
EPA		WELL REWORK RECORD																																																																																																						
NAME AND ADDRESS OF PERMITTEE IMC Kallium, Ltd 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kallium Ltd 1395 135th Avenue Hersey, MI 49639																																																																																																					
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES		STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002 <b>M394</b>																																																																																																				
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 100px; border-collapse: collapse;"> <tr><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: -20px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -20px; top: 50%; transform: translateY(-50%);">E</div>		X																																																																																																				SURFACE LOCATION DESCRIPTION SW 1/4 of NW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1314 ft from (N/S) N Line of quarter section and 650 ft. from (E/W) W line of quarter section		
		X																																																																																																						
WELL ACTIVITY Brine Disposal Enhanced Recovery Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining Lease Name		Total Depth Before Rework 7862  Total Depth After Rework 7862  Date Rework Commenced 10/2/97  Date Rework Completed 10/9/97	TYPE OF PERMIT Individual <input checked="" type="checkbox"/> Area Number of Wells 16  Well Number 1031																																																																																																					
WELL CASING RECORD - BEFORE REWORK																																																																																																								
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																																																		
Size	Depth	Sacks	Type	From	To																																																																																																			
30	80	DRIVEN																																																																																																						
18-5/8	460	750	LITE A																																																																																																					
13-3/8	820	575	LITE A																																																																																																					
9-5/8	5205	2325	LITE A																																																																																																					
7	7862	530	LITE A	7803	7772	4 SH/FT																																																																																																		
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																																																																								
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																																																		
Size	Depth	Sacks	Type	From	To																																																																																																			
30	80	Driven																																																																																																						
18-5/8	460	750	LITE A																																																																																																					
13-3/8	820	575	LITE A																																																																																																					
9-5/8	5205	2325	LITE A																																																																																																					
7	7862	530	LITE A																																																																																																					
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type																																																																																																				
				Log Types	Logged intervals																																																																																																			
Trip 4 1/2 Out of Hole. Parted at 6500'.				PFC	7400'-7610'																																																																																																			
Run overshot and jars. Retrieve bottom hole assembly.																																																																																																								
Run flat bottom mill to 7782'. Trip laying. Run THL																																																																																																								
CERTIFICATION																																																																																																								
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment (Ref CFR 144.32)																																																																																																								
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE <i>Paul McMillen</i>		DATE SIGNED 10/22/97																																																																																																			

MAY 11 1998

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY																																																																						
WASHINGTON, DC 20460																																																																						
EPA		WELL REWORK RECORD																																																																				
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639																																																																			
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES			STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002																																																																	
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 100px; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: -20px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -20px; top: 50%; transform: translateY(-50%);">E</div>											X																																																								SURFACE LOCATION DESCRIPTION SW 1/4 of NW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1314 ft from (N/S) N Line of quarter section and 650 ft. from (E/W) W line of quarter section			
			X																																																																			
WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining Lease Name		Total Depth Before Rework 7862  Total Depth After Rework 7862  Date Rework Commenced 4/25/98  Date Rework Completed 5/3/98		TYPE OF PERMIT <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area Number of Wells 18  Well Number 1031																																																																		
WELL CASING RECORD - BEFORE REWORK																																																																						
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																
Size	Depth	Sacks	Type	From	To																																																																	
30	80	DRIVEN																																																																				
18 - 5/8	460	750	LITE A																																																																			
13 - 3/8	820	575	LITE A																																																																			
9-5/8	5205	2325	LITE A																																																																			
7	7862	530	LITE A	7803	7772	4 SH/FT																																																																
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																																						
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																
Size	Depth	Sacks	Type	From	To																																																																	
30	80	Driven																																																																				
18-5/8	460	750	LITE A																																																																			
13-3/8	820	575	LITE A																																																																			
9-5/8	5205	2325	LITE A																																																																			
7	7862	530	LITE A																																																																			
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type																																																																		
				Log Types	Logged intervals																																																																	
Trip 4 1/2 Out of Hole. Run overshot. Retrieve remaining liner.																																																																						
Run THL. Land high. Trip THL. Run F.B. Mill on drill pipe. Mill to 7790'. Run THL. Land bottom at 7785'.																																																																						
CERTIFICATION																																																																						
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment (Ref CFR 144.32)																																																																						
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE 			DATE SIGNED 05/06/98																																																																



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON DC 20460

## WELL REWORK RECORD

APR 21 1997

## NAME AND ADDRESS OF PERMITTEE

IMC Kalium  
1395 135th Avenue  
Hersey, MI 49639

## NAME AND ADDRESS OF CONTRACTOR

IMC Kalium  
1395 135th Avenue  
Hersey, MI 49639LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRESSTATE  
MI

COUNTY

Osceola

PERMIT NUMBER

MI-133-3G-A002

## SURFACE LOCATION DESCRIPTION

SW 1/4 of NW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 9W

## LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 1314

Location ft. from (N/S) N Line of quarter section

and 650

ft. from (E/W) W Line of quarter section

## WELL ACTIVITY

☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage  
 X Sol'n Mining  
 Lease Name  
 Kalium Hersey

Total Depth Before Rework

7862

Total Depth After Rework

7862

Date Rework Commenced

01-19-97

Date Rework Completed

01-29-97

TYPE OF PERMIT

☐ Individual☒ Area

Number of Wells 16

Well Number

1031

## WELL CASING RECORD — BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
18-5/8	460	750	Lite A			
13-3/8	820	575	Lite A			
9-5/8	5205	2325	Lite A			
7	7862	530	Lite A	7803	7772	4 SH/FT

## WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
18-5/8	460	750	Lite A			
13-3/8	820	575	Lite A			
9-5/8	5205	2325	Lite A			
7	7862	530	Lite A			

## DESCRIBE REWORK OPERATIONS IN DETAIL

USE ADDITIONAL SHEETS IF NECESSARY

 Trip 4 1/2 Out Of Hole Standing  
 Perforate Casing. Run in. Inj. liner  
 Land Bottom at 777.8. Inj. point  
 7767 by PFC

## WIRE LINE LOGS. LIST EACH TYPE

Log Types

Logged Intervals

Perforate

7767-7769

PFC

7740-7660

## CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please type or print)

Paul McMillen  
Minefield Supervisor

SIGNATURE

DATE SIGNED

04/15/97


 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
 WASHINGTON, DC 20460

**WELL REWORK RECORD**
**NAME AND ADDRESS OF PERMITTEE**

 IMC Kalium  
 1395 135th Avenue  
 Hersey, MI 49639

**NAME AND ADDRESS OF CONTRACTOR**

 IMC Kalium  
 1395 135th Avenue  
 Hersey, MI 49639

**LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRES**

N									
X									
S									

 STATE  
 MI

COUNTY

Osceola

PERMIT NUMBER

MI-133-3G-A002

**SURFACE LOCATION DESCRIPTION**

SW 1/4 OF NW 1/4 OF NW 1/4 SECTION 26 TOWNSHIP 17N RANGE 9W

**LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT**

 Surface Location 1314 ft. from (N/S) N Line of quarter section  
 650 ft. from (E/W) W Line of quarter section

**WELL ACTIVITY**

- ☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage

 XSol'n Mining  
 Lease Name

Kalium Hersey

Total Depth Before Rework

7862

Total Depth After Rework

7862

Date Rework Commenced

8-5-96

Date Rework Completed

8-8-96

TYPE OF PERMIT

☐ Individual  
☒ Area  
 Number of Wells 16

Well Number

1031

**WELL CASING RECORD — BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
18-5/8	460	750	Lite A			
13-3/8	820	575	Lite a			
9-5/8	5205	2325	Lite A			
7	7862	530	Lite A	7803	7772	4 SH/FT

**WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)**

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
18-5/8	460	750	Lite A			
13-3/8	820	575	Lite A			
9-5/8	5205	2325	Lite A			
7	7862	530	Lite A	7803	7772	4SH/FT

**DESCRIBE REWORK OPERATIONS IN DETAIL**
**USE ADDITIONAL SHEETS IF NECESSARY**

 Trip 2-7/8 tubing laying  
 perforate 7769 - 7772

 run 4-1/2" seal Tite lined tubing  
 in hole Injecti on point 7769ft

**WIRE LINE LOGS, LIST EACH TYPE**

Log Types

Logged Intervals

**CERTIFICATION**

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

 NAME AND OFFICIAL TITLE (Please type or print) SIGNATURE  
 Kyle Barbot, Minefield Supervisor

DATE SIGNED

8-12-96



## WELL REWORK RECORD

AUG 29 1996

NAME AND ADDRESS OF PERMITTEE  
Kalium Chemicals  
1395 135th Avenue  
Hersey, MI 49639NAME AND ADDRESS OF CONTRACTOR  
Kalium Chemicals  
1395 135th Avenue  
Hersey, MI 49639LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT - 640 ACRESSTATE  
MICOUNTY  
OsceolaPERMIT NUMBER  
MI-133-3G-A002

## SURFACE LOCATION DESCRIPTION

SW 1/4 OF NW 1/4 OF NW 1/4 SECTION 26 TOWNSHIP 17N RANGE 9W

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface Location 1314 N Line of quarter section  
650 ft. from (E/W) W Line of quarter section

## WELL ACTIVITY

- ☐
- Brine Disposal
- 
- ☐
- Enhanced Recovery
- 
- ☐
- Hydrocarbon Storage
- 
- XSol'n Mining
- 
- Lease Name

Total Depth Before Rework

7862

Total Depth After Rework

7862

Date Rework Commenced

4-1-96

Date Rework Completed

4-3-96

## TYPE OF PERMIT

- ☐
- Individual
- 
- ☒
- Area
- 
- Number of Wells 12
- 
- Well Number 1031

Kalium Hersey

## WELL CASING RECORD - BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
18-5/8	460	750	Lite A			
13-3/8	820	575	Lite A			
9-5/8	5205	2325	Lite A			
7	7862	530	Lite A	7803	7774	4 SH/FT

## WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
18-5/8	460	750	Lite A			
13-3/8	820	575	Lite A			
9-5/8	5205	2325	Lite A			
7	7862	530	Lite A	7803	7772	4 SH/FT

## DESCRIBE REWORK OPERATIONS IN DETAIL

USE ADDITIONAL SHEETS IF NECESSARY

## WIRE LINE LOGS, LIST EACH TYPE

Log Types

Logged Intervals

Trip 2-7/8 tubing and 4-1/2 liner  
standing. Perforate 7777-7772.  
Rerun tubing. Injection point =  
7772 feet.

Perforate

7777-7772

## CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please print name of owner)  
Kyle Barbot, Minefield Supervisor

SIGNATURE

DATE SIGNED

4-4-96



AUG 29 1996

## WELL REWORK RECORD

## NAME AND ADDRESS OF PERMITTEE

Kalium Chemicals  
1395 135th ave.  
Hersey, Mi 49639

## NAME AND ADDRESS OF CONTRACTOR

Kalium Chemicals, Ltd.  
1395 135th Ave  
Hersey, Mi 49639LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRESSTATE  
MICOUNTY  
Oceola

## PERMIT NUMBER

MI -133-3G-A002

## SURFACE LOCATION DESCRIPTION

SW 1/4 OF NW 1/4 OF NW 1/4 SECTION 26. TOWNSHIP 17N RANGE 9W

## LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface Location 314 ft. from (N/S) N Line of quarter section  
650 ft. from (E/W) W Line of quarter section

## WELL ACTIVITY

- ☐
- Brine Disposal
- 
- ☐
- Enhanced Recovery
- 
- ☐
- Hydrocarbon Storage

XSol'n Mining  
Lease Name

Kalium Hersey

## Total Depth Before Rework

7862

## Total Depth After Rework

7862

## Date Rework Commenced

2-14-96

## Date Rework Completed

2-15-96

## TYPE OF PERMIT

☐ Individual☒ Area  
Number of Wells 12

## Well Number

1031

## WELL CASING RECORD — BEFORE REWORK

Casing		Cement		Perforations		Annul or Fracture Treatment Record
Size	Depth	Seals	Type	From	To	
30	180	Driven				
18-5/8	460	750	Lite/A			
13-3/8	820	575	Lite/A			
9-5/8	5205	2325	Lite/A			
7	7862	530	Lite/A	7803	7776	

## WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Annul or Fracture Treatment Record
Size	Depth	Seals	Type	From	To	
30	180	Driven				
18-5/8	460	750	Lite/A			
13-3/8	820	575	Lite/A			
9-5/8	5205	2325	Lite/A			
7	7862	530	Lite/A	7803	7774	4 SH/FT

## DESCRIBE REWORK OPERATIONS IN DETAIL

## USE ADDITIONAL SHEETS IF NECESSARY

Trip 2-7/8 tubing and 4-1/2 liner  
standing. Perforate 7774 - 7776.

Rerun tubing. Injection point 7774

## WIRE LINE LOGS. LIST EACH TYPE

## Log Types

## Logged Intervals

perforate

7774-7776

## CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please type or print)

Kyle Barbot, Minefield

Supervisor

SIGNATURE

DATE SIGNED

2-16-96





# RECORD OF WELL DRILLING OR DEEPENING

USE APPROPRIATE BLOCKS, FOR ITEMS NOT LISTED SUBMIT ATTACHMENTS.

REQUIRED BY AUTHORITY OF:

☐ ACT 61 P.A. 1939, AS AMENDED  
(Submit 2 copies within 30 days of completion.)

☒ ACT 315, P.A. 1969, AS AMENDED  
(Submit 2 copies within 60 days of completion.)

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

PERMIT NO./DEEPENING PERMIT NO. <b>M394</b>		TYPE OF WELL (after completion) <b>Solution Mining</b>	
FIELD/FACILITY NAME <b>Hersey Potash</b>		<b>Potash</b>	
WELL NAME & NUMBER <b>Kalium Hersey # 1031</b>			
SURFACE LOCATION <b>SW 1/4 of NW 1/4 of NW 1/4 Section 26 T 17NR 9W</b>			
TOWNSHIP <b>Hersey</b>		COUNTY <b>Osceola</b>	
FOOTAGES: NORTH/SOUTH <b>1314 Ft. from N Line and 66 ft. from</b>		EAST/WEST <b>W Line of 1/4 Sec.</b>	
NAME AND ADDRESS OF OWNER <b>Kalium Chemicals, Ltd 1395 135th Avenue Hersey, MI 49639</b>		SUBSURFACE LOCATION (if directionally drilled) <b>SW 1/4 of SE 1/4 of NW 1/4 Section 26 T 17NR 9W</b>	
NAME AND ADDRESS OF DRILLING CONTRACTOR <b>McLachlan Drilling Company P. O. Box 548 Evart, MI 49631-0548</b>		TOWNSHIP <b>Hersey</b>	
DATE DRILLING BEGAN <b>9/6/94</b>		COUNTY <b>Osceola</b>	
DATE DRILL COMPLETED <b>10/15/94</b>		FOOTAGES: NORTH/SOUTH <b>390 Ft. from S Line and 1179 ft. from</b>	
DATE WELL COMPLETED <b>Incomplete</b>		EAST/WEST <b>E Line of 1/4 Sec.</b>	
TOTAL DEPTH OF WELL Driller <b>7970 7973</b>		FEET DRILLED - CABLE TOOLS <b>From NA To</b>	
FORMATION AT TD <b>Al Salt</b>		FEET DRILLED - ROTARY TOOLS <b>From Surface To 7970</b>	
PROD. FORMATION(S) <b>NA</b>		ELEVATIONS <b>K.B. 1160.8 ft. R.F. 1158.8 ft. R.T. NA ft. Grd. 1147.0 ft.</b>	
DATE OF FIRST INJECTION <b>NA</b>		INJECTED FORMATION <b>NA</b>	
SOLUTION FORMATION <b>Al Salt</b>			

## CASING, CASING LINERS AND CEMENTING, OPERATING STRINGS

## PERFORATIONS

SIZE	WHERE SET	CEMENT	FT. PULLED	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN
30"	80	Driven	0				YES NO
18-5/8"	460	750 sks	0				
13-3/8"	820	575 sks	0				
9-5/8"	5205	2325 sks	0				
7"	7862	530 sks	0			NONE	

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)
NA				NA			Samples Odor Pits Mud Line Gas Log. Fill Up

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	INTERVAL TREATED	MATERIALS AND AMOUNT USED	FORMATION	F.U. L.C.	DEPTH	AMOUNT
NONE	NONE		G. Drift	X	460	1000 bbl

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

BRAND	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTION	RUN AT	DEGREES	YES	NO	DEPTH
MI Wireline		CBL	2980-750			2650	1		XX	
Schlumberger		GR-Caliper	7970-5203			4700	23			
MI Wireline		GR Correlation	7836-7390			5800	20			

## PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu ft	BHP AND DEPTH
0	NA	NA	0	0	NA	NA

AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT

DATE	NAME AND TITLE (PRINT)	SIGNATURE
3/28/95	Lawrence E. Bean, Supervisor	Lawrence E. Bean

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

ELEVATION USED:		GEOLOGIST NAME:	TOPS TAKEN FROM:		
KB 1160.8'			<input checked="" type="checkbox"/> DRILLERS LOG	<input type="checkbox"/> SAMPLE LOG	<input type="checkbox"/> ELECTRIC LOG
FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)	FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)
NOTE: IF WELL DIRECTIONALLY DRILLED, ADD TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE					
0	711	Drift			
711	1450	Michigan Group			
1450	1575	Brown Lime			
1575	1710	Stray Sand			
1710	1829	Marshall			
1829	2570	Coldwater Shale			
2570	3021	Sunbury Shale			
3021	3251	Antrim Shale			
3251	3300 **	Traverse Formation			
3596	3668	Bell Shale			
3668	3993	Dundee			
3993	4251	Detroit River Anhydrite			
4251	4574	Detroit River Salt			
4574	4864	Detroit River Sour			
4869	5103	Massive Anhydrite			
5103	5305	Amhearstburg			
5305	5403	Sylvania			
5403	5557	Bois Blanc			
5557	5892	Bass Island			
5892	5930	Salina G Unit			
5930	6523	F Salt			
6523	6645	E Unit			
6645	6685	D Salt			
6685	6820	C Shale			
6820	7135	B Salt			
7135	7264	A2 Carbonate			
7264	7586	A2 Salt			
7586	7645	A1 Carbonate			
7645	7970	A1 Salt			
	TD				
**3300	3596	Traverse Lime			
IF WELL WAS CORED, ATTACH CORE DESCRIPTION					
DRILL STEM TEST DATA					
LIST ATTACHMENTS:					
Oncourse Gyro Surveys 100-2650 and 2650-5888					
GEOLOGICAL SURVEY USE ONLY					
REVIEWED BY:					
DATE OF REVIEW:					

DAILY DRILLING REPORT

DATE: 10-16-94

OPERATOR: Kalvin Chemical

WELL NAME: Kalvin Henry 1031

RIG: Mag #4

7816' PBD

STATUS: Rig Released

Depth

Footage Cut

DAYS: 40

LAST CSG: 7 @ 7862' (T.O.C. = 5600)

Report Day No.

Drill Rate min/ft

Size

Depth

MUD:

Gradient psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

4 1/2 FINISH RUN CSG

2 R.O. MWL & RUN CCL/G.I.

13 1/4 R.O. HALLIB & CONT CSG

53 1/4 N.O. Bapi cat slips & clean pits & (21).

Rig Released 6:30 AM 10-16-94

Formation Tops

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

CASING Detail RAW 177 Jts 7" TOTALING 7888.96' SET

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

@ 7862' cont @ 7840' - 7991' - 7951' HALLIB cont'd w/

1903x CLASS 'H' 27% KCL 1 1/4% HALLIB 322 & 3403x CLASS 'H'

H 5% micron Bond in 1 1/4% HALLIB 222 27% KCL Displace

w/ 302 BBL MVR LARD Plug w/ 2500psi Float Held cont

in Place @ 2:45 PM 10-15-94

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

## DAILY DRILLING REPORT

DATE: 10-15-94OPERATOR: Kalvin ChenierWELL NAME: Kalvin Henry 1031RIG: MDC #47973 LTD 7970 DTD 39STATUS: RUN 7" CSGDepth 39 Footage Cut 1DAYS: 39 LAST CSG: 958" @ 5203 (T.O.C. = Surf)Report Day No 39 Drill Rate min/ft 1 Size 4.8 Depth 5203MUD: 535 10.3 30 4.8 189.000 LCM-lb/bbl Solids %1 1/2 Dalg1 1/2 cir Hole clean1 1/2 Short Trip 1057051 1/2 cir Hole clean8 L.D. Drill String7 1/2 RU "SCH & Log RAN Bone Hole Geometry Log w/ G.R. & 4 ARM Caliper FM 7973' to 5203' & T.D.4 1/2 RU & RUN 7" CSG

HOURLY BREAKDOWN

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Drit

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

GL

RF

RT

KB

CORD LAST STATION





## DAILY DRILLING REPORT

DATE: 10-13-94OPERATOR: KALUIM CHEMICALWELL NAME: Kal. in HERSEL 1031RIG: MDC. #4781782STATUS: CORING 22FT.

Depth

Footage Cut

DAYS: 371-3LAST CSG: 95/8

" @

5203

(T.O.C. = SURF)

Report Day No.

Drill Rate min/ft

Size

Depth

MUD:

10.3335.81880000.9

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

1 1/2 - PICKUP & MAKEUP CORE BB/s2 1/2 - T.L.H.1/2 - WORK ON SLIPS1 - T.L.H.1 - WASH + RETURN TO BOTTOM1 1/2 - CORING #11 3/4 - FIX JOINT FOR ROTARY1 - CORING #1 22FT.1/4 LIRC5 T.O.H. LAY DOWN 1ST1/2 LAY DOWN CORE1 - W.D.O.4 1/2 MAKEUP CORE BB/s T.L.H.2 - CORING #2

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Drift

Direction

T.V.D.

V. Sec

Nor S

E or W

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

## DAILY DRILLING REPORT

DATE: 10-12-94OPERATOR: Kellum ChiswickWELL NAME: KALAM HERSEY 1031RIG: AD2 #47735 571STATUS: MAKE UP CORE ASSY

Depth Footage Cut

DAYS: 36 1/2 - 3 LAST CSG: 95/8 " @ 5203 (T.O.C. = 5014)

Report Day No.

Drill Rate min/ft

Size

Depth

MUD: 530 10.2 33 4.8 19000 0.8

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

3 1/2 DRLg1/2 SER. Rig1/2 SURJEN3 3/4 DRLg3/4 CIRL + SURJEN 1/2 BIT17- DRLg1- CIRL1/2 SURJEN5 1/2 TOOTH LAR DOWN 2 MINUTE/S + REPAIRING1 = PICK UP CORE B

Formation Tops

A-2 CARB @ 7135A-2 EVAP @ 7264A-1 CARB @ 7646A-1 EVAP @ 7705

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

Nor S

E or W

73734S 15 E71491330106280476652 1/2S 14 E744113451078808

## DAILY DRILLING REPORT

DATE: 10-11-94OPERATOR: KALIAM ChemicalWELL NAME: KALIAM HERSEYRIG: M.D.C. #4

7104 492

STATUS: DRLSDAYS: 35 2-3LAST CSG: 95% @ 520.3 (T.O.C. = Surf)

Report Day No. Drill Rate min/ft

MUD: 525 13.1 28 NC 192000 0.7

Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

1 1/2 T.I.H

2 DRLS

1/2 CIR + S. R. 100

4 DRLS

2 DUBBLE ✓

1 1/2 TEST + 1000 LBS NO ✓

1/2 T.I.H

2 1/4 DRLS

3 1/4 DUBBLE ✓ change manifold check 6000 Formation Tops

UPPER KELLY + BUREAU TO 3000 PSI DUBBLE @ 6645

1/2 T.I.H

C. SHALE @ 6685

3 1/2 DRLS

B. SALT @ 6820

1/2 S. R. 100

2 DRLS

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

Nor S

E or W

6625

10

5205

6490

1221

968

752

6811

10 1/4

5205

6591

1263

1002

772

6997

7 1/2

5205

6775

1292

1026

780

DAILY DRILLING REPORT

DATE: 10-10-94

OPERATOR: KALUMA Chemical

WELL NAME: KALUMA HERSEY 1D.21

RIG: MDC. # 4

66 12 440

STATUS: TIH HOLE IN CP

DAYS: 34 1-3

LAST CSG: 95/8 " @ 520.3 (T.O.C. = SURF)

Report Day No. 10.1 Drill Rate min/ft 29

Size 182.000 Depth 1.0

MUD: 525 10.1 29

W.L.-cc NC Cl-mg/l 182.000 LCM-lb/bbl 1.0 Solids %

Gradient-psi/ft Wt-ppg Vis-sec

HOURLY BREAKDOWN

1 1/2 - DRLG

1/2 - CIRC. to SURF

2 - DRLG

6 1/2 TOOH CHANGES BIT + DRILLING ASSY DRIP HSE-V TIH

1/2 CIRC & REAM 40'

5 DRLG

1/2 SURF

3 1/2 DRLG

1/2 V DOT Pumps

1 1/2 DRLG

3/4 WASH NO Pumps

1 1/2 TOOH HOLE IN DP S 22%

Formation Tops

E UNIT @ 6580

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

Now S

(E or W

6220

20

S33E

6027

1101

862

686

6227

18

S35E

6027

1170

918

725

DAILY DRILLING REPORT

DATE: 10-9-94

OPERATOR: KALIAN CHEMICAL

WELL NAME: KALIAN HERSEY 1031

RIG: MDC #4

6172 347  
Depth Footage Cut

STATUS: DRILL F SALT

DAYS: 33 1-2 LAST CSG: 95/8 " @ 5203 (T.O.C. = SURF.)  
Report Day No. Drill Rate min/ft Size Depth

MUD: 520 10 28 NE 181000 1.1  
Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

1/2 CIR & SURVEY  
5 TOOTH CHANGE BIT TIME  
1/2 SERVICE RIG WASH TO BOTTOM  
7 DRILL  
3 - Pull 1st DN RIG LP & GYRO  
1/2 RIG DOWN GYRO  
3 1/2 DRILL  
3/4 CIR & SURVEY  
3 1/4 DRILL

Formation Tops

G UNIT @ 5892

F-SALT @ 5930

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

Net S

(E or W)

5898

20°

S 37 E

5711

989

770

621

6038

10

S 36 E

5852

1039

811

651



DAILY DRILLING REPORT

DATE: 10-8-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY 1031

RIG: MDC #4

5825 334

STATUS: TOO4 FOR BIT

Depth Footage Cut

DAYS: 32 2-3

LAST CSG: 95/8 " @ 5203 (T.O.C. = 5425)

Report Day No. Drill Rate min/ft

MUD: 0.4 28

Size Depth

Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

1 3/4 DRL9

3 1/2 - CIR + 4500

7 1/4 - DRLS

3 1/2 - CIR + 4500

2 - DRL0

3 3/4 - TOO4 CHANGE BIT + 2000 W.L. B.L. 1000

2 3/4 - 1 1/2

1 1/2 CIR + 4500 TO BOTTOM

4 1/2 DRL0

Formation Tops

BASE IR. @ 555'

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

5492

2 1/2

S 30 E

5333

927

661

515'

5165

2

S 90 E

5507

928

710

55'

570

2 1/2

S 76 E

5322

944

753

576

DAILY DRILLING REPORT

DATE: 10-7-94

OPERATOR: KALUM CHEMICAL

WELL NAME: KALUM HERSEY 1031

RIG: MDC. #4

5401

281

STATUS: DRLG BALD

Depth

Footage Cut

DAYS: 31 1-2

LAST CSG: 958 " @ 5203 (T.O.C. = 504F)

Report Day No

Drill Rate min/ft

Size

Depth

MUD:

498

9.6

28

NC

12500

03

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

2 - WELD ON HEAD

2 1/2 NIPPLE UP TEST BLIND RAINS TO 1000 PSI OK

1 1/2 RIG UP FLOOR MAKE UP BHA TEST PIPE RAINS 1000 PSI

3 STRAP IN HOLE TO 2065

1 1/4 DRLG PLUG + CEMENT 2065 TO 2235

1/2 T.I.H. TO 2957

1/4 TEST CASINGS TO 500" 15 min OK

3/4 DRLG PLUG + DV TOOL 2985

1 1/4 T.I.H. TO 5117 TEST CASINGS 800 PSI 15 min Formation Tops

1 3/4 R.U. 2 JTS + DRLG PLUG-FLOAT COLLOR CEMENT SHOE @

4 1/4 DRLG BALD @ 5403

3/4 CIRC & SURVEY @

4 1/4 DRLG @

DEVIATION SURVEYS

@

@

@

ELEVATIONS

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

North

East/W

GL =

RF =

RT =

KB =

5295

21°

S 36 E

5159

770

604

478



DAILY DRILLING REPORT

DATE: 10-5-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY

RIG: MDC #4

5210 98

STATUS: cmt csg 958'

Depth Footage Cut

DAYS: 29 6

LAST CSG: 958' @ 5205 (T.O.C. = ?)

Report Day No. Drill Rate min/ft

MUD: 509 9.9 28

Size Depth

Gradient-psi/ft Wt-ppg Vis-sec Wt-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

1/2 cir & survey  
8 Daily  
1 1/2 cir & sweep hole  
3 1/2 TOOH L.D 8" DCS & RMRs  
9 1/2 Rev. & Run 958' csg  
1 Rev. & cir & cmt w/ HALIB 1st stage.

Formation Tops

AMHERSTBURG 5102

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D. Drift Direction T.V.D V. Sec N or S E or W

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

RAW 1155+ 958' 40° N 80 L+LC csg total 5204' shoe @ 5203'  
De-VE TOOL @ 3012' center 2966' - 2922 - 2878 - 3057 - 3009'  
3141' - 5158 - 5110' HALIB CMT stage #1 950sw Lite & 250sw class 2 3% clay  
in Both open De-VE'd cir to surface stage #2 950sw Lite  
100 sw class 2 3% clay 1600ABs LITE cir TRACE to surf. cmt in place @

DAILY DRILLING REPORT

DATE: 10-4-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY

RIG: MDC #4

5112 267

STATUS: DRLG Amherstburg

Depth

Footage Cut

DAYS: 28

5-6

LAST CSG: 13 3/8 @ 820 (T.O.C. = 5112F)

Report Day No

Drill Rate min/ft

Size

Depth

MUD: 500

9.9

28

NC.

156000

0.90

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

2 DRLG

1/4 SERVICE RIG

2 1/4 DRLG

1/4 CIR. & SURVEY

5 1/2 DRLG

1/2 SERVICE RIG

13 DRLG

Formation Tops

MASS ANK 4811

Amherstburg @ 5103

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

North

Epr W

4855

22 3/4

S 38 E

4750

1.10

477

381

5072

21

S 38 E

4951

690

541

430

DAILY DRILLING REPORT

DATE: 10-3-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY 1031

RIG: MDC #4

4845 Depth 245 Footage Cut

STATUS: DRLG DET. RIVER SAND  
LOCKED HSS

DAYS: 27 Report Day No. 5-6 Drill Rate min/ft

LAST CSG: 13 3/8 " @ 820 (T.O.C. = 54RF)

MUD: 525 Gradient-psi/ft 10.1 Wt-ppg 29 Vis-sec

NC W.L.-cc 164000 Cl-mg/l 108 LCM-lb/bbl Solids %

HOURLY BREAKDOWN

3 - DRLG  
1/2 CIRC & SURVEY  
2 - DRLG  
1/2 CIRC SWEEP BACK  
2 3/4 TOSH  
3 1/4 BIT CHANGE REAMS TO 0-30-60 T.H.  
1/2 WASH & REAM 18' TO BOTTOM  
11 1/2 DRLG

Formation Tops

@  
@  
@  
@  
@  
@  
@  
@

DEVIATION SURVEYS

@  
@  
@

ELEVATIONS

GL =  
RF =  
BT =  
KB =

COORD LAST STATION

M.D.	Drift	Direction	T.V.D	V. Sec	N or S	E or W
<u>4637</u>	<u>22 1/2</u>	<u>S 74 E</u>	<u>4548</u>	<u>526</u>	<u>469</u>	<u>331</u>



## DAILY DRILLING REPORT

DATE: 10-2-94OPERATOR: Kalium ChemicalWELL NAME: Kalium HERSEY 1031RIG: MDC #44600393STATUS: DRLS DET. RUSK SAIT

Depth

Footage Cut

DAYS: 263-5LAST CSG: 133/P @ 920' (T.O.C. = 500')

Report Day No.

Drill Rate min/ft

Size

Depth

MUD: 5049.729NC780001.4

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

1 - SER - RIG + GAUGE UP NBF2 1/2 - MOVE RIGS + 1 H.1/2 - WASH + REPAIR TO BOTTOM5 1/2 - DRLS1/2 - CIR. + SURVEY10 - DRLS1/2 - CIR. + SURVEY3 1/2 - DRLS

## Formation Tops

DET RUSK SAIT @ 4315DET RUSK SAIT @ 4596

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.O.

Drift

Direction

T.V.D

V. Sec

Nor S

E or W

382120 1/2S30E3989253192175400918°S33E3958313232211413418 1/2S33E4077352265232432220S34E4254414317267451121S36E4431480371304

DAILY DRILLING REPORT

DATE: 10-1-94

OPERATOR: KALIAM Chemical

WELL NAME: KALIAM HERSEY 1031

RIG: MCD # 4

4207 377'

STATUS: TIH w/ Build Assy.

Depth Footage Cut

DAYS: 25 LAST CSG: 13 3/8" @ 820 (T.O.C. = SURF)

Report Day No Drill Rate min/ft

Size Depth

MUD: 468 9.3 29 N/C 78,000 1.3 (SOL)

Gradient-psi/ft Wt-ppg Vis-sec WL-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

1 Dnlg  
1/2 CIR & SURVEY  
10 1/4 Dnlg  
3/4 CIR & SURVEY & SENSING  
4 1/2 Dnlg  
1/2 CIR & SURVEY  
13 1/4 Dnlg  
43 1/4 TOOH L.D. RMR - REDRESS W.B.R & CHANGE BITS # T.I.H

Formation Tops

DUNDEE @ 3892

D. + RVR @ 3993

@

@

@

@

@

@

DEVIATION SURVEYS

@  
@  
@

M.D. Drift Direction T.V.D. V. Sec Nor S E or W

ELEVATIONS

GL =  
RF =  
RT =  
KB =

COORD LAST STATION


DAILY DRILLING REPORT

DATE: 9-30-94

OPERATOR: Kalium Chemical

WELL NAME: Kalium HERSH 10.31

RIG: MCD FW

3830 Depth 408 Footage Cut

STATUS: DRLg

DAYS: 24 Report Day No. 3-4 Drill Rate min/ft

LAST CSG: 13 3/8 " @ 820 (T.O.C. = 5.4RF)

MUD: 468 Gradient-psi/ft 9.25 Wt-ppg 29 Vis-sec

Size NC W.L.-cc 71,000 CI-mg/l 1.8600 Solids %

LCM-lb/bbl

HOURLY BREAKDOWN

2 - DRLg  
1/2 T.O.C. SURVEY  
9 3/4 DRLg  
1 1/2 CIP + SURVEY SER 4.2  
11 1/4 DRLg

Formation Tops

@  
@  
@  
@  
@  
@  
@  
@

DEVIATION SURVEYS

@  
@  
@

ELEVATIONS

GL =  
RF =  
RT =  
KB =

COORD LAST STATION

M.D.	Drift	Direction	T.V.D	V. Sec	N or S	E or W
<u>3413</u>	<u>21 1/2</u>	<u>S39E</u>	<u>3399</u>	<u>107</u>	<u>70</u>	<u>84</u>
<u>3601</u>	<u>20 1/2</u>	<u>S39E</u>	<u>3574</u>	<u>175</u>	<u>122</u>	<u>126</u>

DAILY DRILLING REPORT

DATE: 9-29-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HANSEY 1031

RIG: MCD #4

3422 162

STATUS: DRILLING LINE

Depth Footage Cut

DAYS: 23 5 LAST CSG: 13 3/8 " @ 820 (T.O.C. = SURF)

Report Day No. Drill Rate min/ft Size Depth

MUD: 9-1 29 HC 66000 12

Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

5 1/2 DRLS w/ motor 3260-3307  
1 TOOH to SE. SUB Pull STRESSING TOL  
2 1/2 TOOH LA / DOWN MOTOR  
2 1/2 STRAY + CAL REPAIRS DRAGUP B.D. Pickups D.C.  
2 1/4 F.H. & LA / DOWN 12 JTS DP.  
2 1/2 REAM MOTOR RUN  
5 3/4 DRLS w/ Locked ASS.  
1/4 SER RIG  
1 3/4 DRLS

Formation Tops

TR. Line @ 3300

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

GL =  
RF =  
RT =  
KB =

COORD LAST STATION

DAILY DRILLING REPORT

DATE: 9-28-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY "1031"

RIG: MED #4

3260 210

STATUS: DRLS w/ motor

Depth Footage Cut

DAYS: 22 5-7

LAST CSG: 13 7/8 " @ 820 (T.O.C. = SURF)

Report Day No. Drill Rate min/ft

MUD: 484 93 35

Size

NC 49000 3.7

Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

5 - FLH Check DC.  
1 1/2 STRAP DR I.H.  
1 1/2 PICK UP D.R. TAG L.C. UNIT @ 3030  
1 1/2 DRLS CEMENT  
1 1/4 RIG UP STEERING TOOLS  
15 1/4 DRLS w/ motor 3050 - 3260

T.O.C. - 3030

Formation Tops

TR. Formation

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

XB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

Nor(S)

Estr W

3095

7.9

S47E

3094

21

5

26

3157

11.8

S52E

3155

31

12

34

3220

15.5

S40E

3216

46

22

45

## DAILY DRILLING REPORT

DATE: 9-27-94OPERATOR: KALIAM CHEMICALWELL NAME: KALIAM HENRY 1031RIG: MC.D #4

PBDG 3050±

STATUS: W.O. Cement

DAYS: 21 Depth 21 Footage Cut 21  
 LAST CSG: 13 3/8 " @ 820 (T.O.C. = SURF)  
 MUD: 478 Report Day No. 9.2 Drill Rate min/ft 34 Size 4 Depth 4  
 Gradient-psi/ft 478 Wt-ppg 9.2 Vis-sec 34 W.L.-cc 4 Cl-mg/l 4 LCM-lb/bbl 4 Solids % 4

HOURLY BREAKDOWN

- 1 - MILL ON FISH
- 2 - TOOTH TAKE OFF MILL + MAKE UP BIT
- 3 - T.L.H.
- 6 - Push Fish Down Hole to 3300'
- 1 1/4 - TOOTH
- 4 - T.L.H. P.L.H. 20 JTS OF D.P.
- 3 1/4 - Cement
- 7 - W.O. Cement TRIP D.P. T.L.H. + CHECK D.C.

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

Nor S

E or W

SET PLUG @ 3300 W/Halliburton 225 SX CLAS A"  
 3% salt 1 1/4" x h.dip 1/2 CROW Run 40 BBL F.W. R.H.S.  
 DISPLACED w/ PIT WATER 42 1/2 BBL CEMENT IN PLACE  
 @ 11:30 PM 9-26-94



DAILY DRILLING REPORT

DATE: 9-26-94

OPERATOR: Kalium Chemical

WELL NAME: Kalium HERSEY "1031"

RIG: MCD #4

2860

STATUS: Mill on fish + push Fish Down - 2860

Depth 20 Footage Cut

DAYS: 20 Report Day No.

LAST CSG: 13 3/8 " @ R20 (T.O.C. = 50%)

MUD: 475 Drill Rate min/ft 0.2 Size 34

Depin 52.000 2.5

Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

24 Mill on fish + push Fish Down Hole 1362-TO 2840

HOURLY BREAKDOWN

Formation Tops

Sandburg

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

10:00 AM 9-25-94 - Dr. 10' - 11' - 12'

COSE ON LOCATION

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

GL -

RF -

RT -

KB -

COORD LAST STATION

DAILY DRILLING REPORT

DATE: 9-25-96

OPERATOR: Kalium Chemical

WELL NAME: Kalium Horca 10.21

RIG: MCD #4

1362 —————

STATUS: WELL ON FISH

Depth

Footage Cut

DAYS: 10

LAST CSG: 13 3/8 " @ 820 T.O.C. = S&P

Report Day No.

Drill Rate min/ft

Size

Depth

MUD:

Gradient-psi/ft

Wt-ppg

Vis-sec

W L-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

1 1/2 TOOK LAY DOWN ANTI  
2 PICK UP NRT. MAKE UP NRT BIT BACK OFF BIT  
3 1/4 T1H TRIPES + ROTATION NO BIT  
3- TOOK 1 PIPER IN USE 1 BIT  
2- T1H 1200 FT PIPER BIT + 1200 STUCK THERE  
1- TOSSE  
2- WAIT ON DRILLER CUT OFF CONCRETE ON BIT  
3- T1H DRILLER ON END KNOCKED FISH DOWN L = 1. 362  
1- TRIP TO ECH + ON LAY IN FISH  
1 1/2 TOSSE  
1 3/4 MAKE UP ANTI + BUNDLED S&P + TARS  
3/4 M. ON FISH

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

## DAILY DRILLING REPORT

DATE: 9-24-94OPERATOR: Kalium ChemicalWELL NAME: Kalium Hensay 1031RIG: MDC #43345 180STATUS: TOOH w/ Dyna Drill

Depth

Footage Cut

DAYS: 188LAST CSG: 13 3/8 " @ 820 (T.O.C. = Surf)

Report Day No

Drill Rate min/ft

Size

Depth

MUD: 4689.02147000

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

1 T.I.H1 1/2 RU Steering tool & wash to Bottom2 Dyna Drilling1 1/2 scr. n.c. & Level Derrick6 1/2 Dyna Drilling3/4 Rig Repair8 3/4 Dyna Drilling3 TOOH Rig Down Steering tool

Formation Tops

TRAV FM @ 325TRAV Lm @ 3300

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

Nor(S)

E or W

GL =

31179.2S76E311525927

RF =

321113.9S79E3208432438

RT =

330518.9S41E3299704555

KB =

## DAILY DRILLING REPORT

DATE: 9-23-94OPERATOR: Kalium ChemicalWELL NAME: Kalium Hensley 1031RIG: MDC #4
3165      0  
 Depth      Footage Cut
STATUS: TIH w/ Dyna Drill
 DAYS: 17      0      LAST CSG: 133/8 " @ 820 (T.O.C. = Sun F)  
 Report Day No.      Drill Rate min/ft      Size      Depth

 MUD: 478      9.2      36      NK      66000      4.6  
 Gradient-psi/ft      Wt-ppg      Vis-sec      W.L-cc      Cl-mg/l      LCM-lb/bbl      Solids %

## HOURLY BREAKDOWN

1 LD WASH Pipe

2 TIH w/ ~~connect~~ & Bumper sub - JARS D/C.

1 1/2 Engage FISH & JAR & WORK FREE

6 CHAIN out of Hole w/ FISH LD. Bumper sub & JARS Monitors & Dyna Drill

1 Load out FISHEN tools

2 1/2 TIH w/ B.H

2 1/2 Run fm 3000 to 316.5' & Circ Hole clean

3 3/4 Tool H LD. BH 8" DC's

3 3/4 TIH w/ Monitors & Dyna Drill

## Formation Tops

 @  
 @  
 @  
 @  
 @  
 @  
 @

## DEVIATION SURVEYS

 @  
 @  
 @

M.D.      Drift      Direction      T.V.D      V. Sec      N or S      E or W

## ELEVATIONS

 GL =  
 RF =  
 RT =  
 KB =

## COORD LAST STATION

 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

DAILY DRILLING REPORT

DATE: 9-22-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEL 1031

RIG: MCD. #4

302 Depth 0 Footage Cut

STATUS: LAY DOWN WASHOVER RISE

DAYS: 16

LAST CSG: 13 3/8" @ 820 (T.O.C. = SURF)

MUD: 478 Report Day No.

9.2 Drill Rate min/ft

36V Size

55000 Depth

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

1-FISH FOR DC NO GOOD

3- TOOH LAY DOWN OVER SURF T.I.H w/DC.

1 1/2 SHIP DRILLING LINE

1 FINISH T.I.H.

3 1/2 TAP ON FISH

2 BACK OFF & TOOH LAY DOWN TAPS

3 PICK UP WASH OVER T.I.H

6 1/2 WASH OVER FISH

2 1/2 TOOH

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

DAILY DRILLING REPORT

DATE: 9-21-94

OPERATOR: KALUM CHEMICAL

WELL NAME: KALUM HERSEY 1031

RIG: MCD # 4

3021

STATUS: TRY TO GET OVER FISH

Depth

Footage Cut

DAYS: 15

LAST CSG: 13 3/8 " @ 820 (T.O.C. = SURF.)

Report Day No.

Drill Rate min/ft

Size

Depth

MUD:

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

CL-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

2 1/2 CIR & MIX MUD

1- TOOH

3- RIS REPAIR KELLY SPINNER + TIGHTEN KELLY

2- FINISH TOOH LAY DOWN JARS + 1.8" DC

3- PICKUP WASH DIPE T.H. 95' W.P.

5- WASH OVER FISH

1- CIR

6 1/2 TOOH LAY DOWN W.P. T.H. W/ OVER SHOT

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION



DAILY DRILLING REPORT

DATE: 9-20-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY 1031

RIG: MCD #4

3021

STATUS: MIX MUD

Depth

Footage Cut

DAYS: 14

LAST CSG: 13 3/8 " @ 820 (T.O.C. = 54RF)

Report Day No.

Drill Rate min/ft

Size

Depth

MUD: 9.3

31

N 1

64500

3.1

Gradient psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

3 1/2 MAKE UP JARS + T.H. + WASH TO TOP FISH

1 Pump SWEED + CIRC

1- TRY TO GET OIL FISH NO 90

1 1/2 T.O.H

2 1/2 W.D. Fishing tools

2 MAKE UP Fishing tools T.H.

2 1/2 TRY TO WASH TO FISH NO 90 DISPLACE H.C. 10. R. 15

5 1/2 TOP LAY DOWN JARS + Pick up 8-man hole DE 11. T.H.

3 - CIRC & REMAINING

1 3/4 CIRC + mix MUD

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

GL

RF

RT

KB

COORD LAST STATION

DAILY DRILLING REPORT

DATE: 9-19-94

OPERATOR: Kalium Chemical

WELL NAME: Kalium Hensen 1031

RIG: MAC 4

3165 215  
Depth Footage Cut

STATUS: MAKE UP B.S. + TARS T.H.

DAYS: 13 1-2 LAST CSG: 13 3/8 " @ 820 (T.O.C. = Sun F)  
Report Day No. Drill Rate min/ft Size Depth

MUD: .442 8.5 28 FRESH WATER  
Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

5 1/2 DRLG W/ MOTOR  
1/2 CIRC. SWEEP DNT  
1 - DRLG W/ MOTOR  
6 - WORK TIGHT PIPE  
1 1/4 BACK OFF @ 2100 FT TRIP OUT 4 STD DP. LAY DOWN SUB + S.T.  
1/2 T.L. SCREW BACK IN DP.  
4 WD. WIRELINE + RIG UP WIRELINE + FREE PCIN  
3/4 BACK OFF 8" DC @ 3021  
1/2 RIS DOWN WIRELINE  
4 CHILL OUT OF HOLE LAY DOWN 2 JTS DP WASH  
(@ TOOL JOINT)

Formation Tops

ANTRIM @ 3021  
TRAV FM @  
TRAV LM @  
@  
@  
@  
@

DEVIATION SURVEYS

@  
@  
@

ELEVATIONS

GL =  
RF =  
RT =  
XB =

COORD LAST STATION

M.D.	Orth	Direction	T.V.D	V. Sec	Nor S	Eor W
<u>3002</u>	<u>6.2</u>	<u>S 20 E</u>	<u>3001</u>	<u>9</u>	<u>416</u>	<u>19 77</u>

## DAILY DRILLING REPORT

DATE: 9-18-94OPERATOR: Kalium ChemiconWELL NAME: Kalium Hensley 1031RIG: MDC #4

2950 Depth 190 Footage Cut

STATUS: Dyna Drilling (SHAIR)DAYS: 12 Report Day No. 2 1/2 Drill Rate min/ftLAST CSG: 13 1/2 " @ 820 T.O.C. = Sun AMUD: 442 Gradient-psi/ft 8.5 Wt-ppg 20 Vis-secW/L-cc 1000 Cl-mg/l 1.3 Solids %

HOURLY BREAKDOWN

3/4 Dalg

3 3/4 Poot 20STDS-mix sweep T.I.H 20-25 Fill pump  
sweep & air hole clean

3 RU &amp; RU Gyro survey

3 1/2 T.O.H Pick up Dyna Drill T.I.H w/ 2 1/2" Bont sub  
TO 1920

1 1/2 Rim TO 2760 w/ motor

1 3/4 RU Steering Tool &amp; wash 40 Fill

7 3/4 Dyna Drill &amp; Steering tool

1 1/2 Poot w/ 2STDS Full Steering tool  
Re-run & Re-run T.I.H

1/2 Dyna Drilling

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION  
SURVEYS

@

@

@

Gyro Closure 17.41 Feet N40.58E

ELEVATIONS

GL = Tie in  
RF =  
RT =  
KB =

COORD. LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

(Nor S

(E or W

2650

10

N38E

2649.88

-2.57

13.15

11.42

2800

100

N65E

2799.86

-2.48

14.60

13.25

2910

4.7

S12E

2909.71

1.75

12.55

17.36

DAILY DRILLING REPORT

DATE: 9-17-94

OPERATOR: KALIUM CHEMICAL

WELL NAME: KALIUM HERSEY 1031

RIG: MCD #4

2760' 510'  
Depth Footage Cut

STATUS: Dalg

DAYS: 11 2 1/2  
Report Day No. Drill Rate min/ft

LAST CSG: 13 3/4 " @ 820 (T.O.C. = Surf)  
Size Depth

MUD: .467 9.0 29  
Gradient-psi/ft Wt-ppg Vis-sec

1400 4.6  
W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

3 1/2 Dalg  
1 1/2 sen rig  
3 TOO HQ 2326 CHANGE Bits T.I.H  
1 Dalg  
1 1/4 Rig Repair (U-Joint) + sen rig  
1 3/4 Dalg

DEVIATION SURVEYS

@  
@  
@

Formation Tops

@  
@  
@  
@  
@  
@  
@  
@

M.D. Drift Direction T.V.D V. Sec Nor S E or W

ELEVATIONS

GL =  
RF =  
RT =  
KB =  
COORD LAST STATION

DAILY DRILLING REPORT

DATE: 9-16-90

OPERATOR: KALINIA CHEMICAL

WELL NAME: KALINIA HERSEY ID.P.1

RIG: MCD #4

2250 604

STATUS: DRILLING

DAYS: 10 1 1/2 to 2 LAST CSG: 13 3/8 " @ 820 (T.O.C. = SURF)

Report Day No. 10 Drill Rate min/ft 20 Size NC Depth 820

MUD: .247 8.6 20 NC NC NC NC NC

Gradient-psi/ft 8.6 Wt-ppg 20 Vls-sec NC W.L-cc NC Cl-mg/l NC LCM-lb/bbl NC Solids % NC

HOURLY BREAKDOWN

- 3 - TOOTH WAIT ON FISHING TOOLS TO DE FISH 890'
- 1 - MAKEUP FISHING TOOLS + T.H.
- 2 - TURN ON FISH WORK PILE + TOOTH LAY DOWN FISH
- 1 - T.H. LAY DOWN 6 HRS DP
- 17 DRHS

Formation Tops

MARSHALL @ 1710  
COLUMBIA @ 1829

DEVIATION SURVEYS

@  
@  
@

ELEVATIONS

GL =  
RF =  
RT =  
KB =

COORD LAST STATION

M.D. Drift Direction T.V.D. V. Sec Nor S E or W

K.P. 2800

DAILY DRILLING REPORT

DATE: 9-15-94

OPERATOR: KALIAN CHEMICAL

WELL NAME: KALIAN HERSEY 1031

RIG: MCD. #4

1645 826

STATUS: CIRC OVER FISH TWISTED OFF

Depth 9 Footage Cut 1-2

DAYS: 9 Report Day No. 1-2 LAST CSG: 13 3/8 " @ 820 T.O.C. = SEAF

MUD: .44/2 8.5 20 F.W. Size Depth

Gradient psi/ft Wt-ppg Vis-sec W.L-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

2 T.I.H. D.P. 1900. LAD DAWD D.P. TEST PIPE RIG 15.  
1 MAKE UP BIT T.I.H. TO 163 TPE. ACUMAT.  
1/2 DRLO 162 to 181 cement  
1 T.I.H. RIGGED DR  
1/2 DRLO  
1/2 DRLO AL BELL N RIG 500 RIG  
12 DRLO  
3 1/2 DRLO WASH PIPE IN SWIVEL SER RIG  
3 1/2 DRLO TWISTED OFF 30,000 STRING WT.  
1/2 CIRC

Formation Tops

B. Line @ 1461  
STAR @ 1578  
@  
@  
@  
@  
@  
@

DEVIATION SURVEYS

@  
@  
@

M.D. Drift Direction T.V.D. V. Sec Nor S E or W

ELEVATIONS

GL =  
RF =  
AT =  
KB =

COORD LAST STATION

K2 R 2325



DAILY DRILLING REPORT

DATE: 9-14

OPERATOR: KALUM CHEMICAL

WELL NAME: KALUM HERSEY 1031

RIG: MCD #4

820 13

STATUS: Running

Depth 8 Footage Cut 1-2 FT

DAYS: 8 Report Day No. 1-2

LAST CSG: 13 3/4 " @ 820 (T.O.C. = 50%)

MUD: FRESH

Gradient-psi/ft Wt-ppg Vis-sec W.L-cc Cl-mg/l LCM-lb/bbl Solids %

BREAKDOWN

1/2	REIN HOLE 510 TO 684	
2 1/2	DR 684 TO 760	
2	TRD 760 TO 820	
1	1700 760-820	RAN 20 JOINTS 13 3/4 54.5 LB
1/2	TRD 1 CHD HOLE	ST+C TOTALING 825.58 OPEN
1	TRD 1	END CEMENT W/HOWCO 375
2 1/2	DR 13 3/4 LAG	SK H.L. 3% CL & 1/4 SK FLOCELE
1 1/2	CEMENT	Follow by 200 SK STD. 3% CL
4	W.C. CEMENT	1/4 SK FLOCELE Formation tops 5'
3 1/2	TRD 13 3/4 W/L 20' - 121 R/L F.W. @	
1 1/2	TRD 13 3/4	CEMENT IN PLACE 685 PM
1/2	TRD 13 3/4	CEMENT - RETURNED 9-13-94

WATER  
NE FRESH  
0 0  
2280

5,155

114

	M.D.	Drift	Direction	T.V.D	V. Sec	N or S	E or W
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

END LAST STATION

DAILY DRILLING REPORT

DATE: 9-13-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY "1031"

RIG: MC.D #4

510 N/A

STATUS: Ream Back to Bottom

Depth Footage Cut

DAYS: 7 LAST CSG: 18 5/8 " @ 460 (T.O.C. = SEK.)

Report Day No. Drill Rate min/ft Size Depth

MUD: 446 8.6 65

Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

1 - BRAKE BIT  
8 1/2 - RISE UP + RUN 18 5/8 CAS  
1 1/2 - CEMENT R/H HOLES  
4 - W/O CEMENT CUT CONDUCTOR  
6 - CUT OF 18 5/8 WELD ON FLOW NIPPLE + 2" FILLING  
2 1/2 - TID DRLG OUT CEMENT TAG @ 270  
1/2 - REAM OUT 17 1/2 HOLE 460 TO 510

Formation Tops

@  
@  
@  
@  
@  
@  
@  
@

DEVIATION SURVEYS

@  
@  
@

M.D. Drift Direction T.V.D. V. Sec Nor S E or W

ELEVATIONS

GL =  
RF =  
RT =  
KB =

WORD LAST STATION

DAILY DRILLING REPORT

DATE: 9-12-94

OPERATOR: KALUIM CHEMICAL

WELL NAME: KALUIM HERSEY 1031

RIG: M.C.D #4

STATUS: Rig up to Run 18 1/2 hrs

DAYS: 6

Report Day No.

Drill Rate min/ft

LAST CSG: 30

Size

Depth

MUD:

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

6 1/4

TAR ON FISH

7 1/4

WAIT ON COIL TUBING

DAY: 54N

UP COIL TUBING CLEAN OUT DRILL STRING

DATE: 9-11-94

1 FISH TAR ON EACH COME FISH

CD #4

ON FISH

40 HOLE OPENING WITH MUD T.I.H

1:00 AM W/ HOLE OPENING

10 OUT LAY DOWN JARS

80

Depth

(T.O.C. = DRIVEN)

CM-lb/bbl

Solids %

Fish tooth

#2 tooth

4

Formation Tops

@

@

@

@

@

@

@

@

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

COORD LAST STATION

Formation Tops

@

@

@

@

## DAILY DRILLING REPORT

DATE: 9-11-94OPERATOR: KALWIN CHEMICALWELL NAME: KALWIN HERSEY #1031RIG: MCD #41684STATUS: JAR ON FISH

Depth

Footage Cut

DAYS: 5

Report Day No.

Drill Rate min/ft

LAST CSG: 30

Size

80T.O.C. = DRIFT

Depth

MUD: 462

Gradient-psi/ft

89

Wt-ppg

52

Vis-sec

NC

W L-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

3 - PICK UP FISHING TOOLS RUN IN HOLE Hook Fish TOOH.3 - T.I.H. WITH BIT WASH TO TOP OF FISH #2 TOOH.3 3/4 - PICK UP WASH OVER PIPE WELD TOGETHER T.I.H.1 1/2 - WASH OVER FISH1 3/4 - TOOH, LAY DOWN WASH PIPE5 1/2 - T.I.H. W/ JARS6 1/4 - JAR ON FISH1 1/2 - T.OOH.2 1/4 - MAKE UP FISH1 1/2 - JAR ON FISH

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Drift

Direction

T.V.D.

V. Sec

Nor S

E or W

ELEVATIONS

GL =

FF =

BT =

KB =

COORD LAST STATION

1990

## DAILY DRILLING REPORT

DATE: 9-10-94

Gradient-psi/ft	Wt-ppg	Vis-sec
-----------------	--------	---------

Cl-mg/l	LCM-lb/bbl	Solids %
---------	------------	----------

**E or W**

**KB =**

2 1/2 TOH CUT OFF PATCH 1 + LAV ORANGE CASH



LOST 225 ~~bbi~~ thru Night

DAILY DRILLING REPORT

DATE: 9-9-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY #131

RIG: MDC #4

680 Depth NO FT. Footage Cut

STATUS: WORK STOP PIPE

DAYS: 3 Report Day No. 0 LAST CSG: 30" @ 80 (T.O.C. = DRIVEN)  
Size Depth

MUD: 400 Gradient-psi/ft. 8.8 Wt-ppg 419 Vis-sec N.C W.L.-cc FRESH Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

4 1/2 WORK PIPE + MIX MUD  
4 1/2 RIG UP AND WIRE LINE FREE POINT + BACK OFF  
1-0.C. + Lay DOWN D.C.  
3 RIG DOWN + MADE NEW HOLE  
6 1/2 REBUILD CELLAR AREA  
3 RIG UP  
1 1/2 MIX MUD  
1- DRLS RAT HOLE

Formation Tops

@

@

@

@

@

@

@

@

FREE POINT @ 318'

DEVIATION SURVEYS

@

@

@

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

GL =  
RF =  
RT =  
KB =

COORD LAST STATION





DAILY DRILLING REPORT

DATE: 9-7-94

OPERATOR: Kalium Chemical

WELL NAME: Kalium Hensley 1031

RIG: MDC #4

384 Depth 384' Footage Cut

STATUS: Dry Sand & Gravel

DAYS: 1 Report Day No. 1-1 1/2 Drill Rate min/ft

LAST CSG: 30" Size 60" Depth (T.O.C. = Dr. View)

MUD: 482 Gradient-psi/ft 9.3 Wt-ppg 55 Vis-sec

SDUD MUD W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

12 m i d R u. MDC #4

5 Fill Pits - weld onto 30" conductor mix mud

1 Drill Rat Hole & Mouse Hole

6 Drilling 17 1/2" Hole

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

SDUD 17 1/2" Hole @ 12:30 am 9-7-94

M.D.

Drift

Direction

T.V.D

V. Sec

N or S

E or W

ELEVATIONS

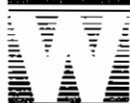
GL =

RT =

RT =

KB =

COORD LAST STATION



Engineering  
Surveying and  
Environmental  
Sciences

P.O. Box 580  
7711 South US 131  
CADILLAC, MI 49601  
616 775-7755

OCT 17 1994

# LETTER OF TRANSMITTAL

TO Geological Survey Division  
Michigan Dept. of Natural Resources  
Proration Unit  
P.O. Box 30256  
Lansing, MI 48909

DATE <b>10/7/94</b>	JOB NO. <b>94183</b>
ATTENTION <b>Supervisor of Wells</b>	
RE: <b>Well Elevations - Kalium Chemical</b>	
<b>Well #1031</b>	
<b>Permit #M394</b>	
<b>Section 26, T17N, R9W</b>	
<b>Hersey Township, Osceola County,</b>	
<b>Michigan</b>	

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via \_\_\_\_\_ the following items:

- ☐ Shop drawings    ☐ Prints    ☐ Plans    ☐ Samples    ☐ Specifications  
☐ Copy of letter    ☐ Change order    ☐ \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION

THESE ARE TRANSMITTED as checked below:

- ☐ For approval    ☐ Approved as submitted    ☐ Resubmit \_\_\_\_\_ copies for approval  
☒ For your use    ☐ Approved as noted    ☐ Submit \_\_\_\_\_ copies for distribution  
☐ As requested    ☐ Returned for corrections    ☐ Return \_\_\_\_\_ corrected prints  
☐ For review and comment    ☐ \_\_\_\_\_  
☐ FOR BIDS DUE \_\_\_\_\_ 19\_\_\_\_ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS \_\_\_\_\_

Elevations for the subject well are as follows:

Ground = 1147.0'    Rig Floor = 1158.8'    Top KDB = 1160.8'

Above elevations are U.S.G.S. datum.

COPY TO Larry Bean - Kalium Chemical

6683

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING MICHIGAN 48909

REVISED PERMIT

## PERMIT TO

☒ DRILL ☐ DEEPEN ☐ REWORK ☐ OPERATE

GRANTED UNDER PROVISIONS OF

☐ Act 61, P.A. 1939, as amended ☒ Act 315, P.A. 1969, as amended  
(M.C.L. 319.1 to 319.27) (M.C.L. 319.211 to 319.236)

Violation of and/or non-compliance with the provisions of the acts and conditions of permit may result in penalties. This permit includes as requirements all the operations and methods proposed by the applicant, unless rejected or altered by the DNR, and along with the attached stipulations are incorporated in its entirety by reference.

WELL NAME **KALIUM HERSEY** WELL NO **#1031**

## LOCATION AND FOOTAGES:

**SBL:** SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Section 26, T17N, R9W, Hersey Township, Osceola County.  
1314' from the North line and 660' from the West line of quarter section.

**BNL:** SW $\frac{1}{4}$ , SE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Section 26, T17N, R9W, Hersey Township, Osceola County.  
390' from the South line and 1179' from the East line of quarter section

## CASING AND SEALING REQUIREMENTS

O.D. SIZE	WT./FT.	CASING GRADE	CONDITION	DEPTH	SACKS	CEMENT	W.O.C. (HRS.)
13 3/8"	54.5#	J-55	New	@ 800'	625		16
9 5/8"	40#	K-55	New	5250'	1800		16
7"	23#	L-80	New	8311'	300		16

1. @ Surface casing shall be set at least 100' into competent bedrock or below all fresh water zones, whichever is deeper, and circulate to surface.
2. No earthen reserve pit is to be dug. Steel tanks are to be used to contain drilling fluids and cuttings.
3. Solids and cuttings may be temporarily stored in asphalt lined impoundment area. All cuttings shall be removed within 30 days after reaching total depth and hauled to a disposal facility approved of by the Cadillac District Geologist, Hal Fitch area code (616) 775-9727.
4. "77" production casing shall be cemented such that an adequate sheath is provided through and above the A2 Carborate. The annulus between the 7" and 9 5/8" casing strings shall be continuously monitored and recorded.
5. Contact Thomas Godbold at the Lansing Office ((517) 334-6945) 24 hours prior to commencing drilling operations.
6. This well shall be drilled and operated in compliance with the Hydrogen Sulfide Rules (R 299.1911 to R 299.1999). NOTIFY LOCAL EMERGENCY PREPAREDNESS COORDINATOR OF WELL LOCATION, H2S POTENTIAL, and CONTINGENCY PLAN AVAILABILITY prior to moving in rig.

OFFICE TO BE NOTIFIED BEFORE DRILLING/DEEPENING STARTS

**CADILLAC DISTRICT OFFICE**  
**(616) 775-9727**

BY

WILLIAM R. LEE

PERMIT COORDINATOR

PAGE 1 of PAGE(S)

(517) 334-6974

FOR THE SUPERVISOR OF WELLS/MINERAL WELLS

### THIS PERMIT IS SUBJECT TO THESE GENERAL CONDITIONS

1. Drilling operations shall not start until the drill site preparation requirements are completed.
2. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all the terms and conditions of this permit and the rules, orders and requirements of the Supervisor of Wells/Mineral Wells.
3. The permittee is required to give notice to public utilities in accordance with Act 53, PA 1974 (M.C.L. 460.701 to 460.718).
4. Any changes from what is stated in the permit application and permit shall be approved by the Supervisor of Wells/Mineral Wells.
5. This permit is valid only for the permittee of issue and any change of ownership shall be accompanied by a request to the Supervisor of Wells/Mineral Wells to transfer the permit from the current owner to the new owner.
6. NOTICE AND REQUIREMENTS FOR SOURCES OF WATER AND WATER WELLS USED IN CONJUNCTION WITH OIL AND GAS OR MINERAL WELL DRILLING AND OPERATIONS" December 1, 1984 is made part of and a condition of this permit.
7. During well completion and testing procedures all fluids shall be contained in tanks and transported to off site disposal facilities.
8. The Michigan Air Pollution Control Commission rules require that a person shall not install nor alter sour gas or oil well production equipment and flare unless a permit to install has been approved by the Commission. An operator is allowed to drill and test a sour well prior to obtaining the necessary permit to install from the Commission, but is not allowed full production or such wells before issuance of the necessary air use permits.
9. This permit does not convey property rights in either real estate or material or does it authorize any injury to private property or invasion of private or public rights or does it waive the necessity of seeking federal and local permits or complying with other state statutes.
10. If a Hydrogen Sulphide contingency plan is required a copy of PART II of the plan shall be posted in the primary briefing area.
11. All trash and garbage shall be removed from the drill site at the completion of drilling.
12. Blowout preventers, accumulators, and pumps shall be certified as operable under the product manufacturer's minimum operational specifications. This certification shall include proper operation of the closing unit valving, pressure gauges and manufacturer's recommended accumulatory fluids. Certification may be obtained through those companies presently used to test the blowout preventers stack and casing. Certification shall be required annually and shall be posted on the rig floor.
13. In addition to the primary closing system, including an accumulator system, the blowout preventers shall have a secondary system. A combination of any two of the following secondary closing systems will be acceptable: Electric-operated pump; Air-operated pump; Hand-operated pump or nitrogen. Extensions with hand wheels are not mandatory.
14. Blowout preventer rams shall be of proper size for the drill pipe being used or production casing being run in the well. Variable type rams of the proper size range will be acceptable.
15. The gas buster and flare system shall be in place and operable prior to drilling into a reservoir known or believed to contain Hydrogen Sulphide in excess of 500 ppm with the intention to complete in and/or test that reservoir.
16. A trip tank, or any accurate fluid monitoring system, as well as a gas buster and flare system where justified, shall be in place when penetrating the A2 Carbonate formation. Changes may be granted by the Department of Natural Resources District Geologist.

# APPLICATION FOR PERMIT TO: ☒ DRILL ☐ DEEPEN ☐ REWORK OR ☐ OPERATE A WELL

REVISION OF PERMIT #M394

MAIL TO:  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028 LANSING MICHIGAN 48909

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION  
MAY RESULT IN FINES AND/OR IMPRISONMENT

## BY AUTHORITY OF:

1a ☐ Act 61, P.A. 1939 as amended  
☐ Oil & Gas  
☐ Brine Disposal  
☐ Hydrocarbon Storage  
☐ Secondary Recovery

1b ☒ Act 315, P.A. 1969, as amended  
☐ Disposal ☐ Storage  
☒ Brine ☐  
☐ Test Well Type  
☐ Single ☐ Blanket

2 Application to: (no fee required if permit is valid)

☐ Deepen ☒ Revise Application ☐ Cancel and Transfer ☐ Convert to ☐

3 Fee enclosed:

☒ No ☐ Yes

4 Do prior permits exist?

☐ No ☐ Yes ☒ Drilled ☐ Abandoned/Terminated

5 List each permit number

6 Fed Employer Ident No or Soc Security No

36-3545577

LOCATE WELL AND OUTLINE UNIT  
ON SECTION PLAT - 640 ACRES

7 Surety Bond:

☒ Blanket ☐ Single Well

8 ☐ Attached

☒ In File

9 Bond No

c/o Bank of Montreal \$25,000

10 Bond Amount:

11 Applicant: (name each "owner" as they are bonded)

Kalium Chemicals, Ltd.

12 Address: (operator only if more than one "owner")

1395 135th Avenue  
Hersey, MI 49639

Phone:

616-832-3755

13 Lease or well name: (be as brief as possible)

Kalium

Hersey

Well number:

1031

14 Surface owner:

Kalium Chemicals, Ltd.

15 Address:

1395 135th Ave., Hersey, MI 49639

Phone:

616-832-3755

16 Surface location (See instructions)

SW 1/4 NW 1/4 of Sec. 26 T. 17N R. 9W

Township

Hersey

County

Osceola

17 Bottom hole location if directional drill (See instructions)

SW 1/4 SE 1/4 of NW 1/4 of Sec. 26 T. 17N R. 9W

Township

Hersey

County

Osceola

18 LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT. (See instructions)

Surface

a Location: 1314 ft from (N/S) N Line of quarter section AND 660 ft from (E/W) W Line of quarter section

Bot Hole

b Location: 390 ft from (N/S) S Line of quarter section AND 1179 ft from (E/W) E Line of quarter section

Drilling

c Unit: N/A ft. from (N/S) Line of drilling unit. AND ft. from (E/W) Line of drilling unit

19 Drilling contractor:

McLachlan

20 Kind of tools (Rotary cable combination)

Rotary

21 Is sour oil or gas expected?

☐ No ☒ Yes

22 Blowout control diagram enclosed?

☐ No ☒ Yes

23 Blowout control (Detail equipment type size trim rating testing choke manifold etc See instructions)

See Attached Drawing

24 Intended Total Depth

8300MD

25 Formation at Total Depth

A-1 Evaporate

26 Producing Formation

A-1 Evaporate

27 Objective Pool or Field

Hersey Potash

28 7800' TVD

PROPOSED DRILLING, CASING, CEMENTING AND SEALING PROGRAM

### HOLE

### CASING

### CEMENT

### MUD

Depth	Geol. Form	Bit Dia.	O.D. Size	Wt./Ft. — Grade — Condition	Depth	Sacks	W.O.C.(hrs.)	Wt.	Vis.	W.L.
800	MICH GR	17.5	13-3/8	54.5-J-55-New	800	625	16	8.4	27	-
5250-5100 (TVD)	Amhstbg	12.25	9-5/8	40-K55-New	5250	1800	16	10.2	27	-
8000-7800 (TVD)	A-1 Evap	8.5	7"	23-L80-New	8000 8311'	300	16	10.4	34	2.6

29 Send correspondence and permit to:

Address

Kalium Chemicals, Ltd, Attn: Lawrence Bean, 1395 135th Ave., Hersey, MI 49639

FOR DNR USE ONLY

Permit	Date Issued	Number
Act 61		
Act 315	6-29-94	M-394

30 Application Prepared By: (Print)

Lawrence E. Bean

Phone:

616-832-3755

31 Signature:

Lawrence E. Bean

Date:

8-8-94

FOR CASHIER'S USE ONLY DO NOT WRITE IN THIS SPACE

54635-1 7/1/94 110-04-446 \$90.00

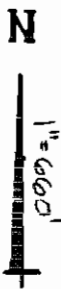
SURVEY RECORD OF WELL LOCATION

☒ Act 61, P.A. 1939, as amended. ☐ Act 315 P.A. 1969 as amended  
Filing of Survey Record, Plat or Plot Plan and Environmental Impact Assessment with Application  
for Permit to Drill are REQUIRED by the above listed Acts, in order to obtain a Permit.

94183

APPLICANT <b>Kalium Chemicals, Ltd.</b>		WELL NAME AND NUMBER <b>Kalium Hersey #1031</b>	
SURFACE LOCATION <b>SW 1/4 of SE 1/4 of NW 1/4 of Section 26 T 17N R 9W Hersey</b>		TOWNSHIP COUNTY <b>Osceola</b>	
BOTTOM HOLE LOCATION <b>SW 1/4 of SE 1/4 of NW 1/4 of Section 26 T 17N R 9W Hersey</b>		COUNTY <b>Osceola</b>	
<p>Instructions: Outline drilling unit and spot well location on Plat shown below (1) Where drilling unit crosses section lines, divide the Plat into an East half and a West half OR a North half and a South half (whichever applies). Outline the Unit and locate the well in two directions from NEAREST quarter section and unit lines (For Act 61, P.A. 1939, as amended).</p>			
<p>2 Location of well in two directions from NEAREST quarter section and unit lines is (For Act 61 P.A. 1939, as amended):</p> <p>Surface Location:</p> <p><u>1314</u> ft. from <u>North</u> line of Quarter Section (north-south)</p> <p><u>660</u> ft. from <u>West</u> line of Quarter Section (east-west)</p> <p>Bottom Hole Location:</p> <p><u>390</u> ft. from <u>South</u> line of Quarter Section (north-south)</p> <p><u>1179</u> ft. from <u>East</u> line of Quarter Section (east-west)</p> <p>Bottom Hole Will Be:</p> <p><u>N/A</u> ft. from _____ line of unit/property (Act 315) lease (north-south)</p> <p>_____ ft. from _____ line of unit/property (Act 315) lease (east-west)</p>		<p>1 PLAT BELOW REPRESENTS ONE FULL SECTION (1 MILE SQUARE)</p> <p style="text-align: right;">N ↑</p> <p style="text-align: center;">SECTION 26</p> <p style="text-align: center;">(Scale of Plat — 1 inch equals 1320 ft.)</p>	
<p>3a Describe wellsite marker Show or describe access route if it is not readily accessible</p> <p><u>Wellsite is marked with a painted wood stake</u> <u>Surface location can be reached from the</u> <u>Southeast, off of 135th Avenue, along an</u> <u>existing access trail to the site.</u></p>			
<p>3b Zoning <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Other: <u>None in effect</u></p>			
<p>3c Effective date: _____</p>			
<p>4 ON SEPARATE PLAT OR PLOT PLAN, LOCATE, IDENTIFY AND SHOW DISTANCES TO:</p> <p>A All roads power lines residences farm buildings and other structures within 300 feet of the stake.</p> <p>B All lakes streams swamps drainage-ways or any other surface water features within 1320 feet of the stake</p>			
<p>5 In an ENVIRONMENTAL IMPACT ASSESSMENT describe all structures and surface features shown detailing plans for hazards prevention and erosion control (See instructions and guidelines for preparation of an environmental impact assessment).</p>			
NAME OF INDIVIDUAL WHO SURVEYED SITE <u>J. Dean Geers</u>		DATE <u>8-1-94</u>	TITLE <u>Professional Surveyor</u>
SURVEYOR <u>WILCOX ASSOCIATES, INC. 7711 S US-131, Cadillac, MI 49601</u>			
I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.			
SIGNATURE (Applicant or authorized representative) <u>Jamery E. Dean</u>		ADDRESS (if different than Lessee)	DATE (Month Day Year) <u>8-8-94</u>





140 TH.

135 TH.

22

23

23

2 MILE RD.

27

26

NORTH LINE SEC. 26

26

1314'

WEST LINE SEC. 26

660'

150' ± E TO ABOVE  
GROUND PIPELINE &  
DRIVE

SURFACE HOLE  
LOCATION

BOTTOM HOLE  
LOCATION

1179'

390'

26

E-W 1/4  
LINE

27

AVE.

PILOT  
FACILITY

N-S 1/4 LINE

AVE.



REVISED 8-1-74

SUPPLEMENTAL PLAT: KALIUM  
HERSEY #1031, SECTION 26,  
T17N-R9W, HERSEY TWP.,  
OSCEOLA CO., MICHIGAN

CLIENT: KALIUM CHEMICAL LTD

DATE 4-25-74

DRN R.M.

CHD RDW

SCALE

V: 1" = 660'

Wilcox Associates



Engineering  
Surveying and  
Environmental  
Sciences

P.O. Box 580  
7711 South US 131  
Cadillac, MI 49601  
616 775-7755

NOTES

F.B.  
PG.

SHEET

1 OF 1

JOB NO.

74183



**Kalium Chemicals** P.O. Box 290, 11461 South 135th Avenue  
Hersey, Michigan 49639 Telephone: (616) 832-3755 Fax: (616) 832-3349

Mr. William R. Lee  
Permit Coordinator  
Permits and Bonding Unit  
Geological Survey Division  
Department of Natural Resources  
P. O. Box 30256  
Lansing, MI 48909

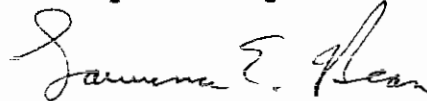
RE: Casing and Cementing Procedures for  
Kalium Hersey 1031 and 1032

1. Conductor pipe of 30 inch diameter will be driven to refusal in this well. Surface hole will be drilled with a 17-1/2" bit 100 feet into the competent rocks of the Michigan Group at a depth of approximately 800 feet. New 13-3/8 inch, 54.50 #/foot, J55 casing will be run to bottom with a Texas pattern shoe. The bottom three joints of casing will be strapped across the collars in three sections. The casing will be cemented with returns to surface. Wait on cement time will be 16 hours.
2. The 12-1/4 inch intermediate hole will be drilled directionally to the Amherstberg Formation (Black lime) at a depth of approximately 5250 feet (5100 feet T.V.D.) as local drilling shows no lost circulation zones deeper. Intermediate casing, new 9-5/8 inch, 40 #/foot, K-55 seamless casing, will be set at this depth and two stage cemented to surface as per cementers recommendations in line with accepted cementing practices.
3. The 8-1/2 inch production hole will be drilled into the A-1 Evaporite at a depth of approximately 8000 feet (7800 feet T.V.D.). The primary objective of this well is the evaluation and production of the potash mineralization of the A-1 Evaporite. The evaluation program will consist of coring the mineralized section of the A-1 Evaporite and appropriate geophysical logs. Production casing will be new 7 inch, 23 #/foot, L-80 seamless casing set in the A-1 Evaporite and cemented back to 5500 feet with premium cement.

1eb200

4. After the well operations have ceased, it will be plugged and abandoned according to Department of Natural Resources requirements.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Lawrence E. Bean".

Lawrence E. Bean  
Minefield Supervisor

cc: Robert E. Thompson  
Jack Rokos  
William E. Booker, Acting Cadillac District Geologist

**STATE OF MICHIGAN  
MINERAL WELL OPERATORS  
ENVIRONMENTAL IMPACT ASSESSMENT**

**Well Identification**

Name and Address of Applicant:	<b>Kalium Chemicals, Ltd.</b> 11461 S. 135th Avenue P. O. Box 333 Hersey, MI 49639-9762
Well Name and Number:	<b>Kalium Hersey #1031</b>
Surface Location:	NW 1/4 of SW 1/4 of NW 1/4
Bottom Location:	SW 1/4 of SE 1/4 of NW 1/4 Section 26, T 17 N, R 9 W Hersey Twp., Osceola Co., MI

**I. Description of Project**

A development well is to be directionally drilled from a surface location 1314 feet from the North line and 660 feet from the West line of the Northwest 1/4 of Section 26, T17N, R9W, to a bottom hole location 390 feet from the South line and 1179 feet from the East line of the same Northwest 1/4 of Section 26, T17N, R9W. The well will be directionally drilled from a new surface location with 30 inch conductor pipe. The well will be drilled to a total anticipated vertical depth of 8000 feet for the evaluation and production of sodium and potassium mineralization through the Niagaran Formation, with total depth in the A-1 Evaporite Formation. The well is located in the Northwest 1/4 of Section 26, T17N, R9W, Hersey Township, Osceola County, Michigan. Surface and mineral rights for the entire Northwest 1/4 of Section 26 are in private ownership and all concerned parties have been informed of the proposed well location and advised of our intentions to complete an application for a permit to drill this mineral well.

The proposed well is part of a project involving several other wells. All wells will be drilled from a common drilling pad area. The area will be on an extension to the South of the existing pad. The new pad area will extend 150 feet South of the existing pad and will require a moderate amount of earthwork for leveling and pad preparation. The land surrounding the wellsite is rolling, open, dormant field. Land use in the surrounding area is mixed agricultural and forest recreational. Natural topography at the site had been a ridge and drainage is both West and East. The drainage to the Northwest is toward Polick Creek, while that to the Northeast is toward Bull Hill Creek. Both creeks are over 1/4 mile away and are part of the Muskegon River watershed. There are no lakes or principal streams within 1/4 mile of the wellsite, however, there is a small seasonally wet area approximately 1200 feet Northeast of the location.

ENVIRONMENTAL IMPACT ASSESSMENT - MINERAL  
KALIUM - KALIUM HERSEY #1031  
PAGE 2

Access to the location will be from the Southeast, along an existing Kalium Chemicals, Ltd. road. This road originates at 135th Avenue, an all-season bituminous surfaced County road running along the North-South 1/4 line of Section 26. Emergency access is also available from the West off of 140th Avenue, a gravel surfaced County road located along the West line of Section 26.

## **II. Environmental Impact Assessment**

The drilling of the well at this location should have only a minor effect on the ecological system of the vicinity. Wildlife is abundant throughout the region, but no special or endangered species are known to exist in the vicinity of the proposed project. The proposed project should have only a slight effect on future population patterns.

The proposed project is for further development and production for solution mining operation purposes. A 7 inch casing will be set to the A-1 Evaporite and cemented back to 5500 feet, below the intermediate casing in this solution mining well.

A minimal disruption to the environment will result by concentrating this well in the same areas as those which have already been drilled. A total area of approximately 7-1/4 acres has previously been prepared and up to an additional 1/2 acre will be prepared for drilling this well and two future wells. Tree removal is not necessary to clear the drilling pad. Appropriate drill site drainage and sedimentation control measures have been incorporated in the operational plan. The new pad will be hard surfaced, as necessary, to provide containment of all drilling fluids. We have not experienced any unusual erosional problems at this location.

Due to environmental considerations, Kalium Chemicals, Ltd. does not plan to use conventional reserve pits. The well will be drilled using a pit liner rig base sealed around the cellar, rathole, and mousehole for containment of fluids. The following special measures will be taken in the handling of drilling solids and fluids. The drilling fluids will be circulated through closed-looped working pits. The solids control in the drilling fluid will be handled through a special flocculent and centrifuge system to provide effective separation of the brine from the drill cuttings. Brine will be disposed of in an approved disposal well. The semi-dry drill cuttings will be temporarily stored on an impervious barrier at the drilling location. The barrier will be sloped such that any leachate will collect at a central location to allow easy recovery and subsequent disposal in a disposal well. The volume of the containment area, including its side-dikes will be such, as to hold several days of precipitation, in addition to holding the drilling cuttings expected from the wells. Final disposition of the cuttings will be at an approved landfill site.

ENVIRONMENTAL IMPACT ASSESSMENT - MINERAL  
KALIUM - KALIUM HERSEY #1031  
PAGE 3

Access to the wellsite will be from the Southeast off 135th Avenue and will utilize the existing service road. Emergency access is also available from the West off 140th Avenue. No new access trail will need to be constructed.

Although other wells at this location have not encountered significant concentrations of hydrogen sulfide gas, intentions are to proceed as if the possibility does exist at this location. Appropriate safety measures will be taken. In general, the Administrative Rules for the Management of Hydrogen Sulfide, effective September 2, 1987, prepared by the Geological Survey Division of the Department of Natural Resources, will be observed. The site is well isolated from human habitation. There is only one residence within 1/4 mile of the wellsite, lying approximately 1/4 mile Southwest of the location.

An existing water supply well had been drilled for use in drilling the previous wells. This same water well will be used in drilling the proposed mineral well. Immediately following the drilling and completion operations of all wells which are part of this project, the well will be properly abandoned.

Upon completion of drilling and producing operations the well will be plugged in accordance with Michigan Department of Natural Resources instructions prior to abandonment. The drilling pad area will be fine graded, stabilized, and restored, as nearly as possible, to its original condition. This project is expected to have only a slight effect on the immediate environment.

### **III. Possible Alternatives to the Proposed Well Location**


The proposed location has been selected on the basis of a geologic interpretation and an extensive on-site evaluation. By drilling this well from a common drilling pad with others, a minimal disruption of the environment will result. Preparation of the drilling pad will not require additional tree removal. No new access trail will be required. The proposed project area is well isolated from surface waters and human habitation. We believe the site is generally well suited for the undertaking of this project and that adequate protection of the environment can be maintained at this location. For these reasons, we believe that drilling the well from the surface location proposed is the best available alternative.

### **IV. Any Irreversible and Irretrievable Commitment of Resources**

The proposed project should not require a significant commitment of natural resources. The productivity of the land utilized for the drilling pad and access road will be lost during the life of the project, but the surface resources of the drill site will not be irreversibly committed. Drilling of the well will not curtail the use of the surrounding environment.

## V. Summary

In order to minimize surface disturbances, this development well is to be drilled from a common surface location which has been used for other wells in this 1/4 section. The total surface area necessary for this project encompasses approximately 7 3/4 acres. The drilling pad is located on rolling, generally open land. The drill site and the surrounding 7 3/4 acres are a part of the commercial potash solution mining facility operated by Kalium Chemicals, Ltd. Land use in the surrounding area is mixed agricultural and forest recreational. Natural drainage from the location is both Northeasterly and Northwesterly toward tributaries of the Muskegon River. There are no lakes or principal streams within 1/4 mile of the proposed wellsite, however, there is a small, seasonally wet area located approximately 1265 feet Northeast of the wellsite. Appropriate drill site drainage and sedimentation control measures have been included in the operational plan. Although it is not anticipated that sour gas will be encountered at this location, the intention is to proceed as if the possibility exists. Access to the wellsite will be from the Southeast off of 135th Avenue and will utilize the existing service road. Emergency access is also available from the West off of 140th Avenue. We consider the environmental impact of this project to be minimal, and will make every effort to insure protection and preservation of the environment during the course of our drilling and producing operations.

  
Applicant's Representative

Comments by Department of Natural Resources Representative:

---

Authorized Representative



SOUR GAS CONTINGENCY PLAN - PART II  
KALIUM HERSEY #1031  
SECTION 26, T17N, R9W,  
HERSEY TOWNSHIP, OSCEOLA COUNTY, MICHIGAN

RESIDENTS WITHIN 1/4 MILE OF WELLSITE

1. Douglas Dailey  
11431 S. 140th Avenue  
Hersey, MI 49639  
Phone: 616-832-4698

EMERGENCY TELEPHONE NUMBERS

<u>Name</u>	<u>Location</u>	<u>Number</u>
Company Personnel		
Larry Bean	Hersey, MI (Office)	616-832-3755
Don Purvis	Hersey, MI (Office)	616-832-3755
MDNR		
Hal Fitch	Cadillac, MI	616-775-9727
Raymond Vugrinovich	Lansing (Office) (Home)	517-334-6951 517-339-9547
Sheriff	Osceola County	911 or 616-832-2288
State Police	Reed City, MI	911 or 616-832-2221
Ambulance	Alpha 1 N. Patterson Road Reed City, MI 49677	911 or
Hospital	Reed City Hospital N. Patterson Road Reed City, MI 49677	616-832-3271
Fire Department	Hersey, MI	911 or 616-832-3255
Director of Emergency Services		
Dallas Jenks	Osceola Co. (Office) (Emergency)	616-832-6172 911
Pollution Emergency Alerting System (PEAS)		800-292-4706

SOUR GAS CONTINGENCY PLAN - PART II  
KALIUM - KALIUM HERSEY #1031  
PAGE 2

NEAREST PUBLIC TELEPHONE

The nearest public telephone is located in front of the General Store in the town of Hersey. It is located North 1/2 mile on 140th Avenue, then West 4 miles on Hersey Road to the general store in the town of Hersey, on 180th Avenue.

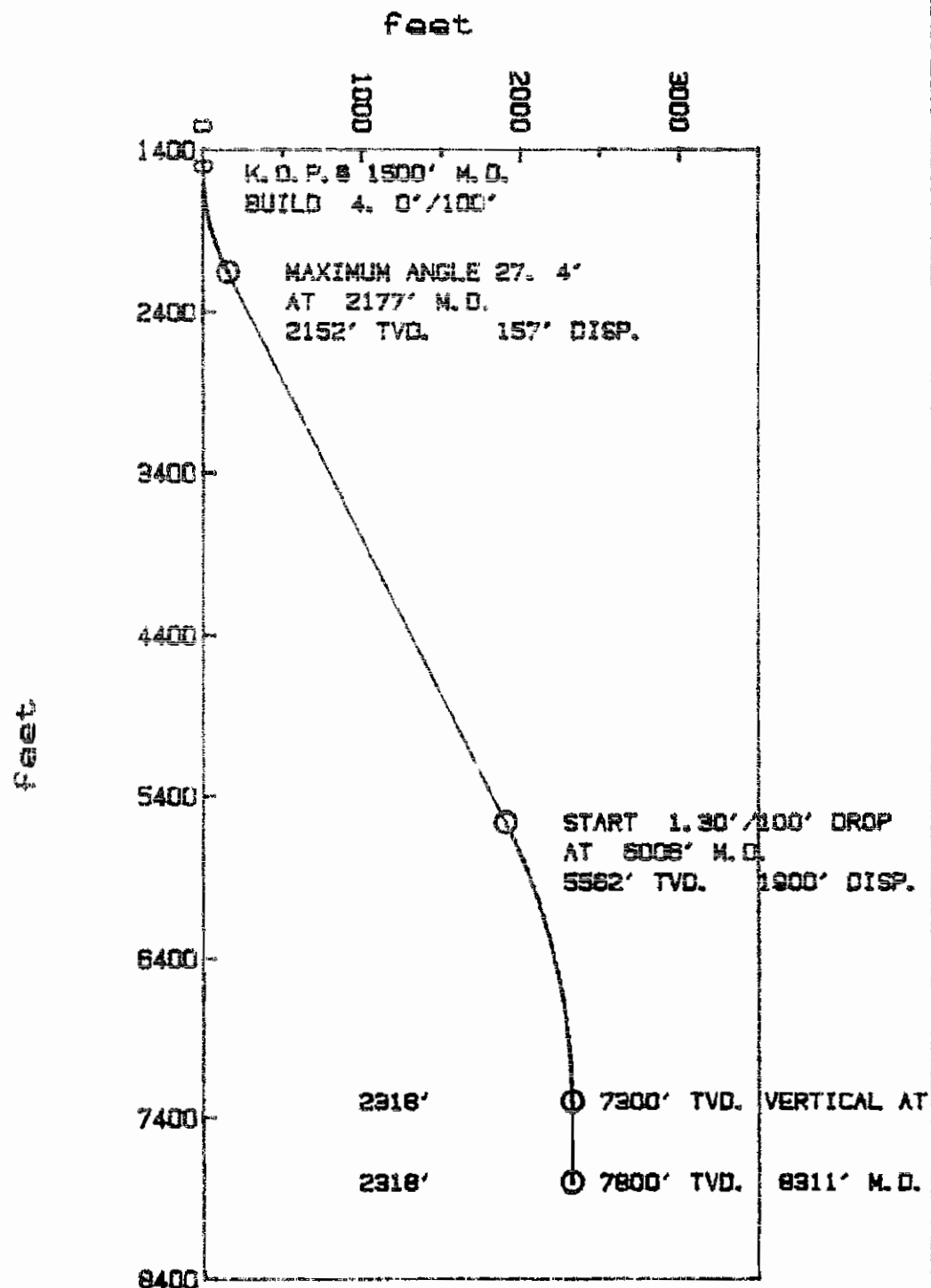
MUD TREATMENT

A gas buster will be provided.

NOTE: For location of residences, public gathering places and evacuation routes, see vicinity map.

KALIUM CHEMICAL  
KALIUM HERSEY WELL # 1031  
HERSEY TOWNSHIP , OSCEOLA COUNTY

VERTICAL SECTION 1 IN. = 1000 FT.



KALIUM CHEMICAL

OBJECTIVE NO. 1:

KALIUM HERSEY WELL # 1031  
HERSEY TOWNSHIP , OSCEOLA COUNTY 2318' S66.11'E OF  
SURFACE LOCATION 7811' M.D. 7300' TVD.  
936' SOUTH 2121' EAST

PLAN VIEW  
1 IN. = 800 FT.

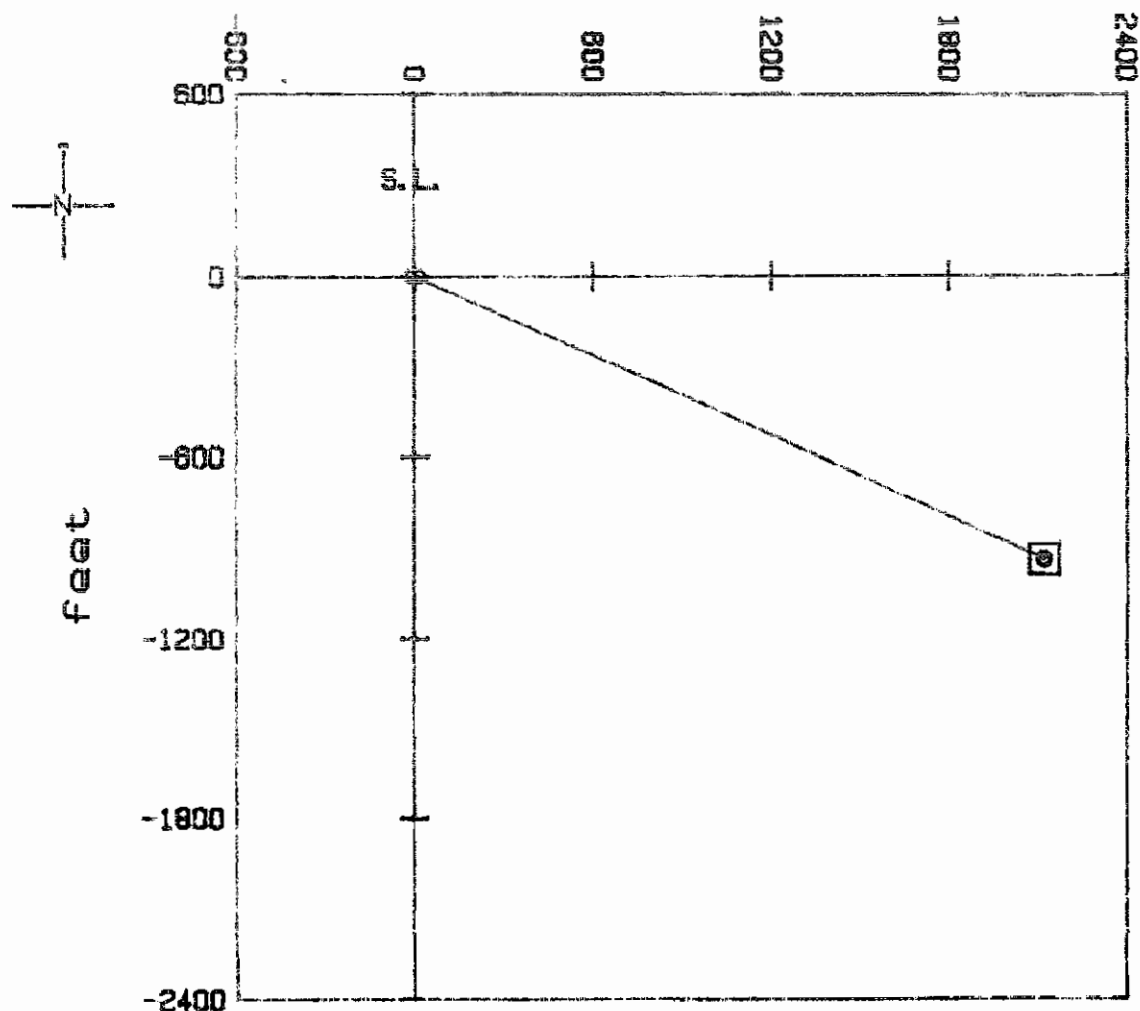
OBJECTIVE NO. 2:

2318' S66.11'E OF  
SURFACE LOCATION 8311' M.D. 7800' TVD.  
936' SOUTH 2121' EAST

SUBMITTED BY:

Directional Drilling Contractors, Inc.

100' X 100' TARGET  
feet



# WELLHEAD BLOWOUT CONTROL SYSTEM

Optional worksheet supplement for Application For Permit to Drill Deepen Rework or Operate a Well By Authority of Act 61 P.A. 1939 as amended or Act 315 P.A. 1969 as amended

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

Box 30028  
Lansing, Michigan 48909

COMPANY

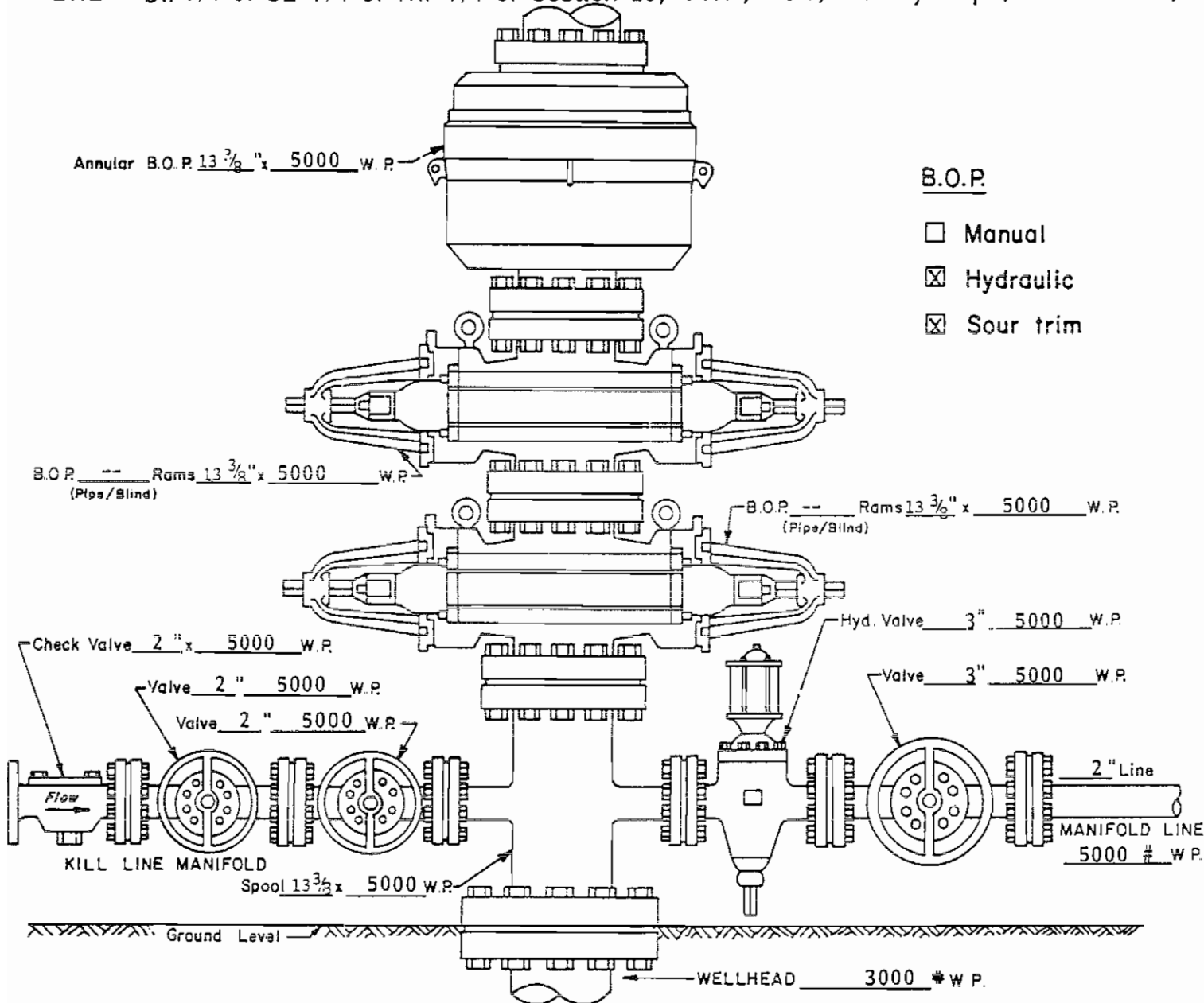
Kalium Chemicals, Ltd.

WELL NAME AND NUMBER

Kalium Hersey 1031

LOCATION

SHL - NW 1/4 of SW 1/4 of NW 1/4 of Section 26, T17N, R9W, Hersey Twp., Osceola Co., MI  
BHL - SW 1/4 of SE 1/4 of NW 1/4 of Section 26, T17N, R9W, Hersey Twp., Osceola Co., MI



B.O.P.

☐ Manual

☒ Hydraulic

☒ Sour trim

Fill blanks with applicable information. If not applicable, enter "N.A." or cross-out item shown. Enter other pertinent information below.

This BOP system to be used on surface casing while drilling to intermediate casing point.

6681

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING MICHIGAN 48909

**PERMIT TO**

☒ DRILL ☐ DEEPEN ☐ REWORK ☐ OPERATE

GRANTED UNDER PROVISIONS OF

☐ Act 61 P.A. 1939, as amended ☒ Act 315, P.A. 1969 as amended  
(M.C.L. 319.1 to 319.27) (M.C.L. 319.211 to 319.236)

Violation of and/or non-compliance with the provisions of the acts and conditions of permit may result in penalties. This permit includes as requirements all the operations and methods proposed by the applicant, unless rejected or altered by the DNR, and along with the attached stipulations are incorporated in its entirety by reference.

WELL NAME

**KALIUM HERSEY #1014**

WELL NO

## LOCATION AND FOOTAGES:

**SBL:** NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , SEC. 26, T17N, R9W, HERSEY TOWNSHIP, OSCOLA COUNTY.  
1304 feet from SOUTH line and 650 feet from WEST line of quarter section.

**NBL:** NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , SEC. 26, T17N, R9W, HERSEY TOWNSHIP, OSCOLA COUNTY.  
367 feet from NORTH line and 286 feet from WEST line of quarter section.

## CASING AND SEALING REQUIREMENTS

O.D. SIZE	WT./FT.	CASING GRADE	CONDITION	DEPTH	SACKS	CEMENT	W.O.C. (HRS.)
13 3/8"	54.5#	J-55	NEW	@ 800'	625		16
9 5/8"	40#	K-55	NEW	5250'	1800		16
7"	23#	L-80	NEW	8000'	300		16

1. @ Surface casing shall be set at least 100' into competent bedrock or below all fresh water zones, whichever is deeper, and circulate to surface.
2. No earthen reserve pit is to be dug. Steel tanks are to be used to contain drilling fluids and cuttings.
3. Solids and cuttings may be temporarily stored in asphalt lined impoundment area. All cuttings shall be removed within 30 days after reaching total depth and hauled to a disposal facility approved of by the Cadillac District Geologist, Hal Fitch (616-775-9727).
4. "77" production casing shall be cemented such that an adequate sheath is provided through and above the A2 Carbonate. The annulus between the 7" and 9 5/8" casing strings shall be continuously monitored and recorded.
5. Contact Thomas Godbold at the Lansing Office (517-334-6945) 24 hours prior to commencing drilling operations.
6. This well shall be drilled and operated in compliance with the Hydrogen Sulfide Rules (R 299.1911 to R 299.1999). NOTIFY LOCAL EMERGENCY PREPAREDNESS COORDINATOR OF WELL LOCATION, H<sub>2</sub>S POTENTIAL, and CONTINGENCY PLAN AVAILABILITY prior to moving in rig.

OFFICE TO BE NOTIFIED BEFORE DRILLING/DEEPENING STARTS

**CADILLAC DISTRICT OFFICE**  
**(616) 775-9727**

BY

**WILLIAM R. LEE**

PERMIT COORDINATOR

PAGE 1 of PAGE(S)

**(517) 334-6974**  
FOR THE SUPERVISOR OF WELLS/MINERAL WELLS

PERMIT <b>N 394</b>	ISSUED <b>6/29/94</b>	TYPE OF WELL <b>SOLUTION MINE</b>
CANCEL AND TRANSFER	ISSUED	FORMATION <b>A-1 EVAPORATE</b>
DEEPENING PERMIT		DEPTH <b>8000'</b>
PERMIT EXPIRES <b>12/29/94</b>		KIND OF TOOLS <b>ROTARY</b>
ISSUED TO <b>KALIUM CHEMICALS LTD. 1395 SOUTH 135th AVENUE HERSEY, MI 49639</b>		

## THIS PERMIT IS SUBJECT TO THESE GENERAL CONDITIONS

- 1 Drilling operations shall not start until the drill site preparation requirements are completed
- 2 Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all the terms and conditions of this permit and the rules, orders and requirements of the Supervisor of Wells/Mineral Wells.
- 3 The permittee is required to give notice to public utilities in accordance with Act 53, PA 1974 (M C L 460 701 to 460 718).
- 4 Any changes from what is stated in the permit application and permit shall be approved by the Supervisor of Wells/Mineral Wells.
- 5 This permit is valid only for the permittee of issue and any change of ownership shall be accompanied by a request to the Supervisor of Wells/Mineral Wells to transfer the permit from the current owner to the new owner.
- 6 NOTICE AND REQUIREMENTS FOR SOURCES OF WATER AND WATER WELLS USED IN CONJUNCTION WITH OIL AND GAS OR MINERAL WELL DRILLING AND OPERATIONS" December 1, 1984 is made part of and a condition of this permit
- 7 During well completion and testing procedures all fluids shall be contained in tanks and transported to off site disposal facilities.
- 8 The Michigan Air Pollution Control Commission rules require that a person shall not install nor alter sour gas or oil well production equipment and flare unless a permit to install has been approved by the Commission. An operator is allowed to drill and test a sour well prior to obtaining the necessary permit to install from the Commission, but is not allowed full production of such wells before issuance of the necessary air use permits.
- 9 This permit does not convey property rights in either real estate or material or does it authorize any injury to private property or invasion of private or public rights or does it waive the necessity of seeking federal and local permits or complying with other state statutes.
- 10 If a Hydrogen Sulphide contingency plan is required, a copy of PART II of the plan shall be posted in the primary briefing area.
- 11 All trash and garbage shall be removed from the drill site at the completion of drilling.
- 12 Blowout preventers, accumulators, and pumps shall be certified as operable under the product manufacturer's minimum operational specifications. This certification shall include proper operation of the closing unit, valving, pressure gauges, and manufacturer's recommended accumulatory fluids. Certification may be obtained through those companies presently used to test the blowout preventers stack and casing. Certification shall be required annually and shall be posted on the rig floor.
- 13 In addition to the primary closing system, including an accumulator system, the blowout preventers shall have a secondary system. A combination of any two of the following secondary closing systems will be acceptable: Electric-operated pump; Air-operated pump; Hand-operated pump or nitrogen. Extensions with hand wheels are not mandatory.
- 14 Blowout preventer rams shall be of proper size for the drill pipe being used or production casing being run in the well. Variable type rams of the proper size range will be acceptable.
- 15 The gas buster and flare system shall be in place and operable prior to drilling into a reservoir known or believed to contain Hydrogen Sulphide in excess of 500 ppm with the intention to complete in and/or test that reservoir.
- 16 A trip tank, or any accurate fluid monitoring system, as well as a gas buster and flare system where justified, shall be in place when penetrating the A2 Carbonate formation. Changes may be granted by the Department of Natural Resources District Geologist.



APPLICATION FOR PERMIT TO: ☒ DRILL ☐ DEEPEN ☐ REWORK OR ☐ OPERATE A WELLMAIL TO:  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30020 LANSING MICHIGAN 48909NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION  
MAY RESULT IN FINES AND/OR IMPRISONMENT.

## BY AUTHORITY OF:

1a ☐ Act 61, P.A. 1939 as amended  
☐ Oil & Gas  
☐ Brine Disposal  
☐ Hydrocarbon Storage  
☐ Secondary Recovery1b ☒ Act 315, P.A. 1969, as amended  
☐ Disposal ☐ Storage  
☒ Brine ☐  
☐ Test Well Type  
☒ Single ☐ Blanket

2 Application to: (no fee required if permit is valid)

☐ Deepen ☐ Revise Application ☐ Cancel and Transfer ☐ Convert to ☐

3 Fee enclosed:

☐ No ☒ Yes

4 Do prior permits exist?

☐ No ☐ Yes ☒ Drilled ☐ Abandoned/Terminated

5 List each permit number

6 Fed Employer Ident No or Soc Security No

36-3545577

7 Surety Bond:

☒ Blanket ☐ Single Well8 ☐ Attached☒ On File

9 Bond No

C/O

Bank of Montreal

10 Bond Amount:

\$25,000

11 Applicant: (name each "owner" as they are bonded)

Kalium Chemicals, Ltd.

12 Address: (operator only if more than one "owner")

Phone:

1395 S. 135th Avenue  
Hersey, MI 49639

616-832-3755

13 Lease or well name: (be as brief as possible)

Well number:

Kalium Hersey

1014

14 Surface owner:

Kalium Chemicals, Ltd.

15 Address:

Phone:

1395 S. 135th Avenue, Hersey, MI 49639 616-832-3755

16 Surface location (See instructions)

Township

County

NW 1/4 SW 1/4 of NW 1/4 of Sec. 26 T. 17N R. 9W

Hersey

Osceola

17 Bottom hole location if directional drill (See instructions)

Township

County

NW 1/4 NW 1/4 of NW 1/4 of Sec. 26 T. 17N R. 9W

Hersey

Osceola

18 LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT. (See instructions)

Surface

a Location: 1304 ft from (N/S) ~~South~~ <sup>North</sup> Line of quarter section AND 650 ft from (E/W) West Line of quarter section

Bot Hole

b Location: 367 ft from (N/S) North Line of quarter section AND 256 ft from (E/W) West Line of quarter section

Drilling

c Unit: N/A ft. from (N/S) Line of drilling unit AND ft. from (E/W) Line of drilling unit

19 Drilling contractor:

20 Kind of tools (Rotary cable combination)

21 Is sour oil or gas expected?

22 Blowout control diagram enclosed?

McLachlan Drilling Co. Rotary

☐ No ☒ Yes☐ No ☒ Yes

23 Blowout control (Detail equipment type size rpm rating testing choke manifold etc See instructions)

See Attached Drawing

24 Intended Total Depth

8000

25 Formation at Total Depth

A-1 Evaporate

26 Producing Formation

A-1 Evaporate

27 Objective Pool or Field

Hersey Potash

28

## PROPOSED DRILLING, CASING, CEMENTING AND SEALING PROGRAM

HOLE			CASING			CEMENT		MUD		
Depth	Geol. Form	Bit Dia.	O.D. Size	Wt./Ft. — Grade — Condition	Depth	Sacks	W.O.C.(hrs.)	Wt.	Vis.	W.L.
800	MICH GR	17.5	13-3/8"	54.5-J55-New	800	625	16	8.4	27	-
5250-5100	Amhstbg	12.25	9-5/8"	40-K55-New	5250	1800	16	10.2	27	-
(TVD)										
8000-7800	A-1 Evap.	8.5	7"	23-L80-New	8000	300	16	10.4	34	2.6
(TVD)										

29 Send correspondence and permit to:

Address

Kalium Chemicals, Ltd., Attn: Lawrence Bean, Box 290, Hersey, MI 49639

FOR DNR USE ONLY

Permit	Date Issued	Number
<input type="checkbox"/> Act 61	6-29-94	M-394
<input checked="" type="checkbox"/> Act 315		

30 Application Prepared By: (Print)

Lawrence Bean

Phone:

616-832-3755

31 Signature:

Date:

FOR CASHIER'S USE ONLY. DO NOT WRITE IN THIS SPACE

SURVEY RECORD OF WELL LOCATION

☐ Act 61, P.A. 1939, as amended. ☒ Act 315 P.A. 1969, as amended.  
Filing of Survey Record, Plat or Plot Plan and Environmental Impact Assessment with Application  
for Permit to Drill are REQUIRED by the above listed Acts, in order to obtain a Permit.

94183

APPLICANT <b>Kalium Chemicals, Ltd.</b>		WELL NAME AND NUMBER <b>Kalium Hersey #1014</b>	
SURFACE LOCATION <b>NW 1/4 of SW 1/4 of NW 1/4 of Section 26 T 17N R 9W Hersey</b>		COUNTY <b>Osceola</b>	
BOTTOM HOLE LOCATION <b>NW 1/4 of NW 1/4 of NW 1/4 of Section 26 T 17N R 9W Hersey</b>		COUNTY <b>Osceola</b>	
<p>Instructions: Outline drilling unit and spot well location on Plat shown below (1.). Where drilling unit crosses section lines, divide the Plat into an East half and a West half OR a North half and a South half (whichever applies). Outline the Unit and locate the well in two directions from NEAREST quarter section and unit lines (For Act 61, P.A. 1939, as amended).</p>			
<p>2 Location of well in two directions from NEAREST quarter section and unit lines is (For Act 61, P.A. 1939, as amended):</p> <p>Surface Location:</p> <p><u>1304</u> ft. from <u>South</u> line of Quarter Section <small>(north-south)</small></p> <p><u>650</u> ft. from <u>West</u> line of Quarter Section <small>(east-west)</small></p> <p>Bottom Hole Location:</p> <p><u>367</u> ft. from <u>North</u> line of Quarter Section <small>(north-south)</small></p> <p><u>286</u> ft. from <u>West</u> line of Quarter Section <small>(east-west)</small></p> <p>Bottom Hole Will Be:</p> <p><u>N/A</u> ft. from _____ line of unit/property (Act 315) lease <small>(north-south)</small></p> <p>_____ ft. from _____ line of unit/property (Act 315) lease <small>(east-west)</small></p> <p>3a. Describe wellsite marker. Show or describe access route if it is not readily accessible <u>Wellsite is marked with a painted wood stake.</u> <u>Surface location can be reached from the</u> <u>SE. off of 135th Avenue, along an existing</u> <u>access trail to the site.</u></p> <p>3b. Zoning <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Other: <u>None in effect</u></p> <p>3c. Effective date: _____</p>		<p>1. PLAT BELOW REPRESENTS ONE FULL SECTION (1 MILE SQUARE)</p> <p>(Scale of Plat — 1 inch equals 1320 ft.)</p>	
<p>4 ON SEPARATE PLAT OR PLOT PLAN LOCATE, IDENTIFY AND SHOW DISTANCES TO:</p> <p>A All roads, power lines, residences, farm buildings, and other structures within 300 feet of the stake.</p> <p>B All lakes, streams, swamps, drainage-ways or any other surface water features within 1320 feet of the stake.</p> <p>5 In an ENVIRONMENTAL IMPACT ASSESSMENT describe all structures and surface features shown detailing plans for hazards prevention and erosion control (See instructions and guidelines for preparation of an environmental impact assessment)</p>			
NAME OF INDIVIDUAL WHO SURVEYED SITE <u>Richard D. Wilcox</u>		DATE <u>4-28-94</u>	
ADDRESS <u>WILCOX ASSOCIATES, INC. 7711 S. US-131 PO Box 580 Cadillac, MI 49601</u>		TITLE <u>Professional Surveyor</u>	
I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.			
SIGNATURE (Applicant or authorized representative) <u>Lawrence E. Dean</u>		DATE (Month Day Year) <u>6-8-94</u>	



140 TH.

135 TH.

BOTTOM HOLE LOCATION

22  
27

23  
26

23

2 MILE RD

NORTH LINE SEC. 26

26

367'  
286'  
1324'

WEST LINE SEC. 26

160' ± E TO ABOVE  
GROUND PIPELINE &  
DRIVE

SURFACE HOLE  
LOCATION

26

27

E-W 1/4  
LINE

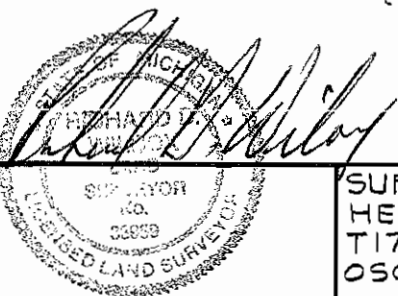
PILOT  
FACILITY

N-S 1/4 LINE

AVE.

POLICK

CREEK



SUPPLEMENTAL PLAT: KALIAM  
HERSEY # 1014, SECTION 26,  
T17N-R9W, HERSEY TWP,  
OSCEOLA CO., MICHIGAN

CLIENT: KALIAM CHEMICAL LTD

DATE  
4-25-74  
DRN  
R.M.  
CHD  
RDW  
SCALE  
V: 1"=660'  
H: 1"=660'

**Wilcox Associates**  
Engineering  
Surveying and  
Environmental  
Sciences  
NOTES  
F.B.  
PG.

P.O. Box 580  
7711 South US 131  
Cadillac, MI 49601  
616 775-7755

SHEET  
1 OF 1

JOB NO.  
94183

KALIUM CHEMICAL  
KALIUM HERSEY WELL # 1014  
HERSEY TOWNSHIP , OSCEOLA COUNTY

OBJECTIVE NO. 1:  
1024' N20.49'W OF  
SURFACE LOCATION  
7421' M. D. 7300' TVD.  
957' NORTH 364' WEST

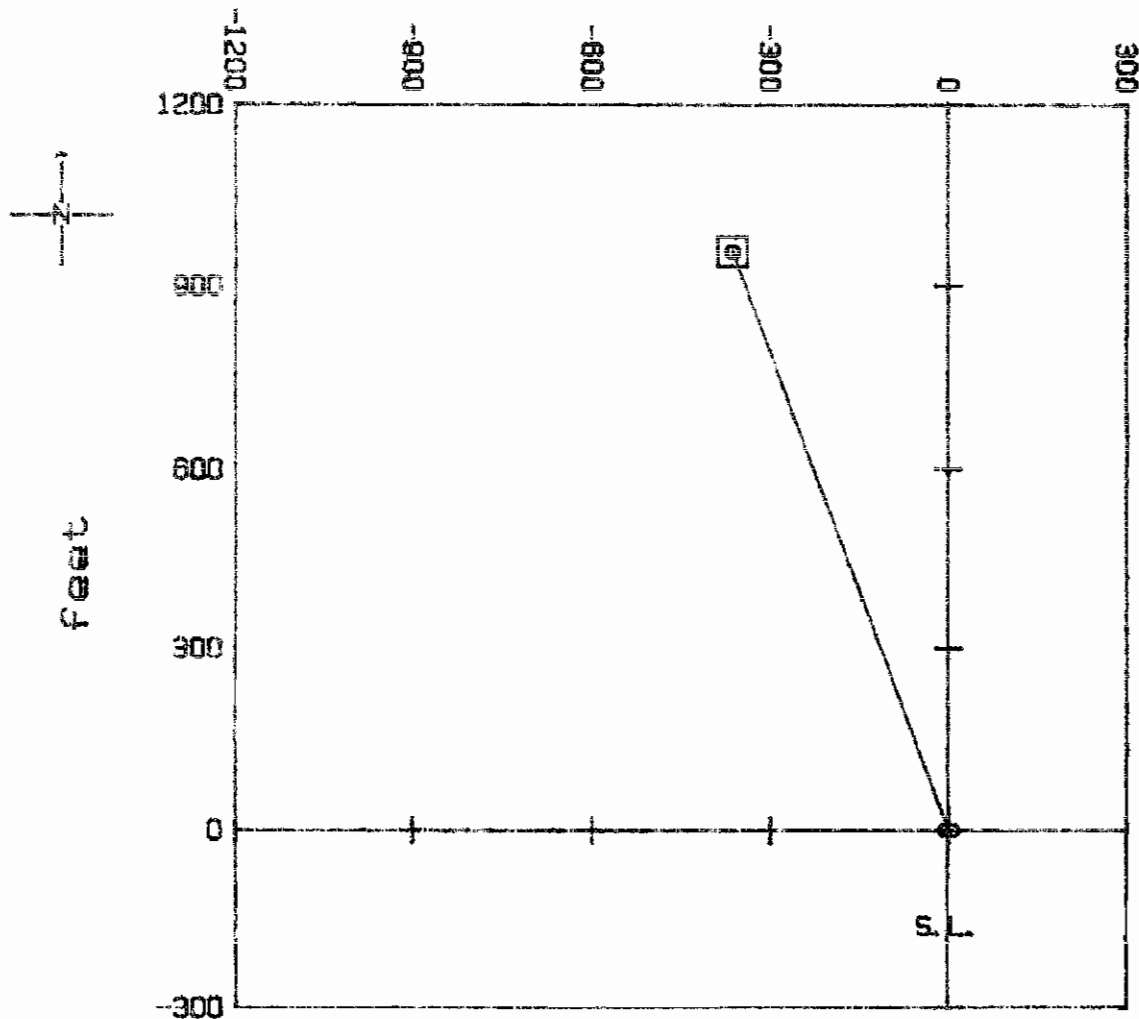
PLAN VIEW  
1 IN. = 300 FT.

OBJECTIVE NO. 2:  
1024' N20.49'W OF  
SURFACE LOCATION  
7921' M. D. 7800' TVD.  
957' NORTH 364' WEST

SUBMITTED BY:

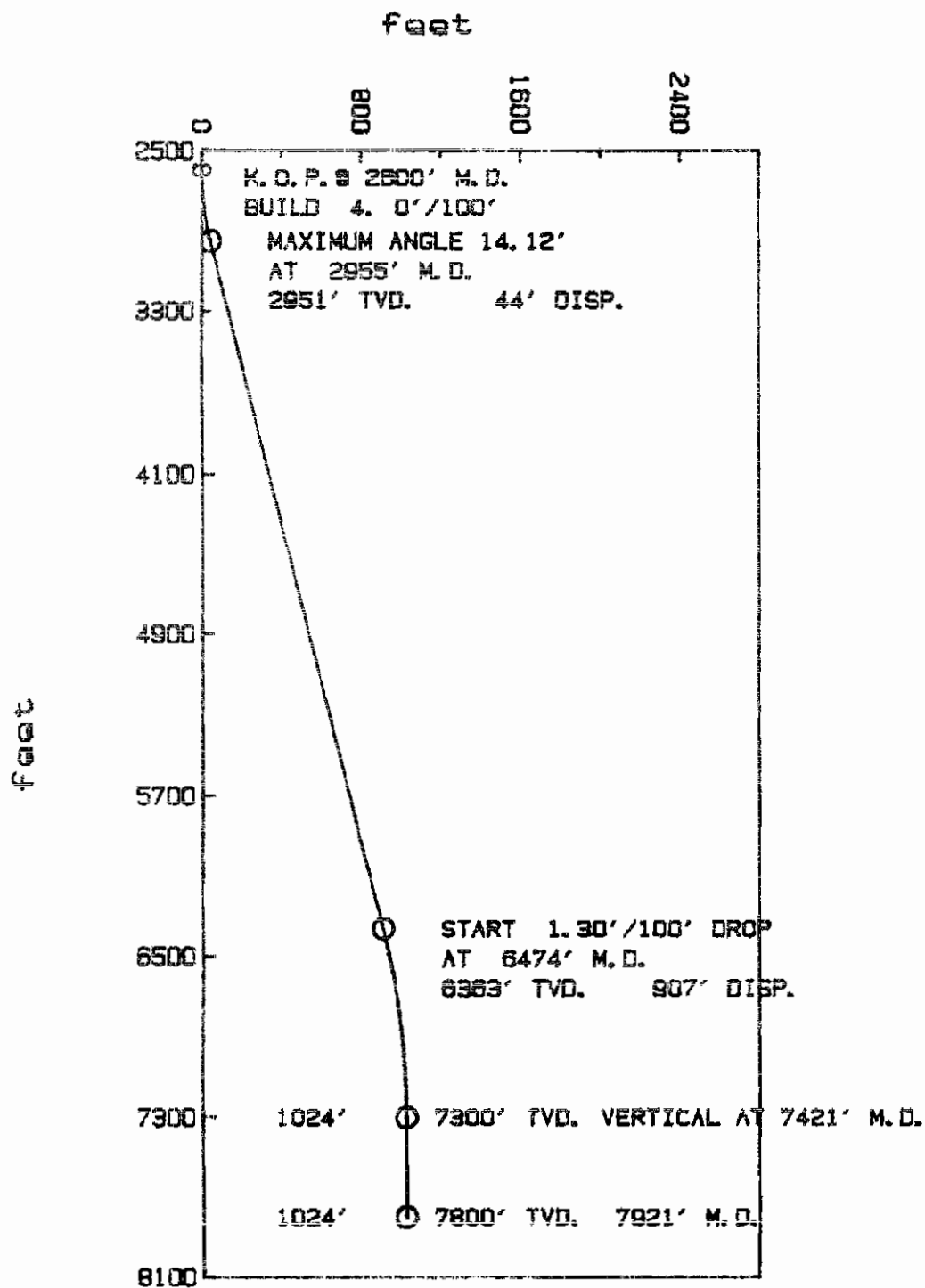
Directional Drilling Contractors, Inc.

50'X 50' TARGET  
feet



KALIUM CHEMICAL  
KALIUM HERSEY WELL # 1014  
HERSEY TOWNSHIP , OSCEOLA COUNTY

VERTICAL SECTION 1 IN. = 800 FT.



STATE OF MICHIGAN  
MINERAL WELL OPERATORS  
ENVIRONMENTAL IMPACT ASSESSMENT

**Well Identification**

Name and Address of Applicant:	<b>Kalium Chemicals, Ltd.</b> 11461 S. 135th Avenue P. O. Box 333 Hersey, MI 49639-9762
Well Name and Number:	<b>Kalium Hersey #1014</b>
Surface Location:	NW 1/4 of SW 1/4 of NW 1/4
Bottom Location:	NW 1/4 of NW 1/4 of NW 1/4 Section 26, T 17 N, R 9 W Hersey Twp., Osceola Co., MI

**I. Description of Project**

A development well is to be directionally drilled from a surface location 1324 feet from the North line and 650 feet from the West line of the Northwest 1/4 of Section 26, T17N, R9W, to a bottom hole location 367 feet from the North line and 286 feet from the West line of the Northwest 1/4 of Section 26, T17N, R9W. The well will be directionally drilled from a new surface location with 30 inch conductor pipe. The well will be drilled to a total anticipated vertical depth of 8000 feet for the evaluation and production of sodium and potassium mineralization through the Niagaran Formation, with total depth in the A-1 Evaporite Formation. The well is located in the Northwest 1/4 of Section 26, T17N, R9W, Hersey Township, Osceola County, Michigan. Surface and mineral rights for the entire Northwest 1/4 of Section 26 are in private ownership and all concerned parties have been informed of the proposed well location and advised of our intentions to complete an application for a permit to drill this mineral well.

The proposed well is part of a project involving several other wells. All wells will be drilled from a common drilling pad area. The area will be on an extension to the South of the existing pad. The new pad area will extent 150 feet South of the existing pad and will require a moderate amount of earthwork for leveling and pad preparation. The land surrounding the wellsite is rolling, open, dormant field. Land use in the surrounding area is mixed agricultural and forest recreational. Natural topography at the site had been a ridge and drainage is both West and East. The drainage to the Northwest is toward Polick Creek while that to the Northeast is toward Bull Hill Creek. Both creeks are over 1/4 mile away and are part of the Muskegon River watershed. There are no lakes or principal streams within 1/4 mile of the wellsite, however, there is a small seasonally wet area approximately 1200 feet Northeast of the location.

ENVIRONMENTAL IMPACT ASSESSMENT - MINERAL  
KALIUM - KALIUM HERSEY #1014  
PAGE 2

Access to the location will be from the Southeast, along an existing Kalium Chemicals, Ltd. road. This road originates at 135th Avenue, an all-season bituminous surfaced County road running along the North-South 1/4 line of Section 26. Emergency access is also available from the West off of 140th Avenue, a gravel surfaced County road located along the West line of Section 26.

## **II. Environmental Impact Assessment**

The drilling of the well at this location should have only a minor effect on the ecological system of the vicinity. Wildlife is abundant throughout the region, but no special or endangered species are known to exist in the vicinity of the proposed project. The proposed project should have only a slight effect on future population patterns.

The proposed project is for further development and production for solution mining operation purposes. A 7 inch casing will be set to the A-1 Evaporite and cemented back to 5500 feet, below the intermediate casing in this solution mining well.

A minimal disruption to the environment will result by concentrating this well in the same areas as those which have already been drilled. A total area of approximately 7-1/4 acres has previously been prepared and up to an additional 1/2 acre will be prepared for drilling this well and two future wells. Tree removal is not necessary to clear the drilling pad. Appropriate drill site drainage and sedimentation control measures have been incorporated in the operational plan. The new pad will be hard surfaced, as necessary, to provide containment of all drilling fluids. We have not experienced any unusual erosional problems at this location.

Due to environmental considerations, Kalium Chemicals, Ltd. does not plan to use conventional reserve pits. The well will be drilled using a pit liner rig base sealed around the cellar, rathole, and mousehole for containment of fluids. The following special measures will be taken in the handling of drilling solids and fluids. The drilling fluids will be circulated through closed-looped working pits. The solids control in the drilling fluid will be handled through a special flocculent and centrifuge system to provide effective separation of the brine from the drill cuttings. Brine will be disposed of in an approved disposal well. The semi-dry drill cuttings will be temporarily stored on an impervious barrier at the drilling location. The barrier will be sloped such that any leachate will collect at a central location to allow easy recovery and subsequent disposal in a disposal well. The volume of the containment area, including its side-dikes will be such, as to hold several days of precipitation, in addition to holding the drilling cuttings expected from the wells. Final disposition of the cuttings will be at an approved landfill site.



ENVIRONMENTAL IMPACT ASSESSMENT - MINERAL  
KALIUM - KALIUM HERSEY #1014  
PAGE 3

Access to the wellsite will be from the Southeast off 135th Avenue and will utilize the existing service road. Emergency access is also available from the West off 140th Avenue. No new access trail will need to be constructed.

Although other wells at this location have not encountered significant concentrations of hydrogen sulfide gas, intentions are to proceed as if the possibility does exist at this location. Appropriate safety measures will be taken. In general, the Administrative Rules for the Management of Hydrogen Sulfide, effective September 2, 1987, prepared by the Geological Survey Division of the Department of Natural Resources, will be observed. The site is well isolated from human habitation. There is only one residence within 1/4 mile of the wellsite, lying approximately 1/4 mile Southwest of the location.

An existing water supply well had been drilled for use in drilling the previous wells. This same water well will be used in drilling the proposed mineral well. Immediately following the drilling and completion operations of all wells which are part of this project, the well will be properly abandoned.

Upon completion of drilling and producing operations the well will be plugged in accordance with Michigan Department of Natural Resources instructions prior to abandonment. The drilling pad area will be fine graded, stabilized, and restored, as nearly as possible, to its original condition. This project is expected to have only a slight effect on the immediate environment.

### **III. Possible Alternatives to the Proposed Well Location**

The proposed location has been selected on the basis of a geologic interpretation and an extensive on-site evaluation. By drilling this well from a common drilling pad with others, a minimal disruption of the environment will result. Preparation of the drilling pad will not require additional tree removal. No new access trail will be required. The proposed project area is well isolated from surface waters and human habitation. We believe the site is generally well suited for the undertaking of this project and that adequate protection of the environment can be maintained at this location. For these reasons, we believe that drilling the well from the surface location proposed is the best available alternative.

### **IV. Any Irreversible and Irretrievable Commitment of Resources**

The proposed project should not require a significant commitment of natural resources. The productivity of the land utilized for the drilling pad and access road will be lost during the life of the project, but the surface resources of the drill site will not be irreversibly committed. Drilling of the well will not curtail the use of the surrounding environment.

ENVIRONMENTAL IMPACT ASSESSMENT - MINERAL  
KALIUM - KALIUM HERSEY #1014  
PAGE 4

**V. Summary**

In order to minimize surface disturbances, this development well is to be drilled from a common surface location which has been used for other wells in this 1/4 section. The total surface area necessary for this project encompasses approximately 7 3/4 acres. The drilling pad is located on rolling, generally open land. The drill site and the surrounding 7 3/4 acres are a part of the commercial potash solution mining facility operated by Kalium Chemicals, Ltd. Land use in the surrounding area is mixed agricultural and forest recreational. Natural drainage from the location is both Northeasterly and Northwesterly toward tributaries of the Muskegon River. There are no lakes or principal streams within 1/4 mile of the proposed wellsite, however, there is a small, seasonally wet area located approximately 1265 feet Northeast of the wellsite. Appropriate drill site drainage and sedimentation control measures have been included in the operational plan. Although it is not anticipated that sour gas will be encountered at this location, the intention is to proceed as if the possibility exists. Access to the wellsite will be from the Southeast off of 135th Avenue and will utilize the existing service road. Emergency access is also available from the West off of 140th Avenue. We consider the environmental impact of this project to be minimal, and will make every effort to insure protection and preservation of the environment during the course of our drilling and producing operations.

  
\_\_\_\_\_  
Applicant's Representative

Comments by Department of Natural Resources Representative:

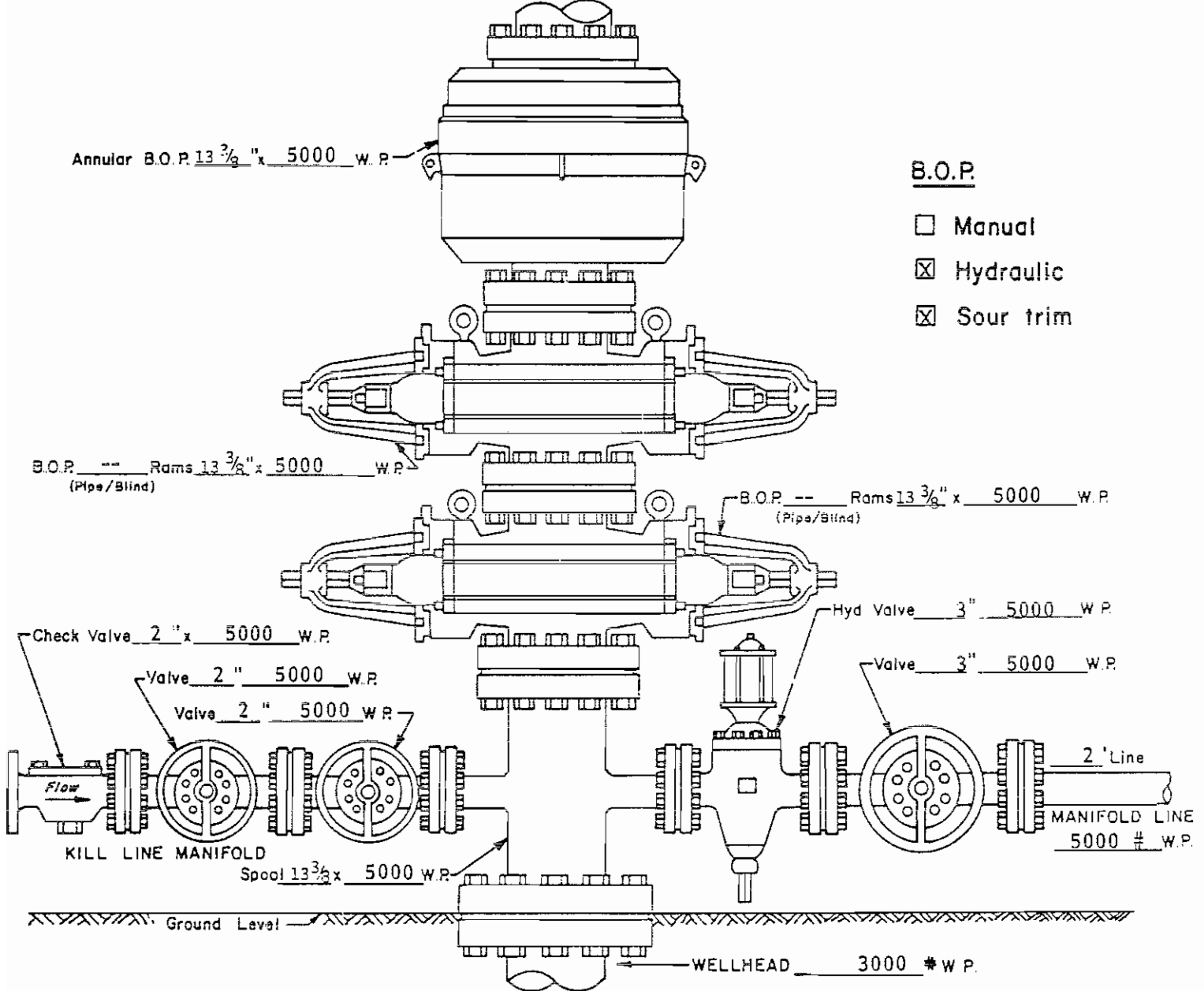
\_\_\_\_\_  
Authorized Representative

# WELLHEAD BLOWOUT CONTROL SYSTEM

Optional worksheet supplement for Application For Permit to Drill Deepen Rework or Operate a Well By Authority of Act 61 P.A. 1939, as amended or Act 315 P.A. 1969 as amended

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
Box 30028  
Lansing Michigan 48909

COMPANY <b>Kalium Chemicals, Ltd.</b>	WELL NAME AND NUMBER <b>Kalium Hersey 1014</b>
LOCATION <b>SHL - NW 1/4 of SW 1/4 of NW 1/4 of Section 26, T17N, R9W, Hersey Twp, Osceola Co., MI</b> <b>BHL - NW 1/4 of NW 1/4 of NW 1/4 of Section 26, T17N, R9W, Hersey Twp., Osceola Co., MI</b>	



B.O.P.

☐ Manual

☒ Hydraulic

☒ Sour trim

Fill blanks with applicable information. If not applicable, enter "N.A." or cross-out item shown. Enter other pertinent information below.

This BOP system to be used on surface casing while drilling to intermediate casing point.



**Kalium Chemicals** P.O. Box 290, 11461 South 135th Avenue  
Hersey, Michigan 49639 Telephone: (616) 832-3755 Fax: (616) 832-3349

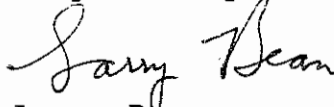
Mr. William R. Lee  
Permit Coordinator  
Permits and Bonding Unit  
Geological Survey Division  
Department of Natural Resources  
P. O. Box 30256  
Lansing, MI 48909

RE: Casing and Cementing Procedures for Kalium Hersey 1014

1. Conductor pipe of 30 inch diameter will be driven to refusal in this well. Surface hole will be drilled with a 17-1/2" bit 100 feet into the competent rocks of the Michigan Group at a depth of approximately 800 feet. New 13-3/8 inch, 54.50 #/foot, J55 casing will be run to bottom with a Texas pattern shoe. The bottom three joints of casing will be strapped across the collars in three sections. The casing will be cemented with returns to surface. Wait on cement time will be 16 hours.
2. The 12-1/4 inch intermediate hole will be drilled directionally to the Amherstberg Formation (Black lime) at a depth of approximately 5250 feet (5100 feet T.V.D.) as local drilling shows no lost circulation zones deeper. Intermediate casing, new 9-5/8 inch, 40 #/foot, K-55 seamless casing, will be set at this depth and two stage cemented to surface as per cementers recommendations in line with accepted cementing practices.
3. The 8-1/2 inch production hole will be drilled into the A-1 Evaporite at a depth of approximately 8000 feet (7800 feet T.V.D.). The primary objective of this well is the evaluation and production of the potash mineralization of the A-1 Evaporite. The evaluation program will consist of coring the mineralized section of the A-1 Evaporite and appropriate geophysical logs. Production casing will be new 7 inch, 23 #/foot, L-80 seamless casing set in the A-1 Evaporite and cemented back to 5500 feet with premium cement.

4. After the well operations have ceased, it will be plugged and abandoned according to Department of Natural Resources requirements.

Respectfully submitted,

A handwritten signature in cursive script that reads "Larry Bean".

Larry Bean  
Minefield Supervisor

cc: Robert E. Thompson  
Jack Rokos  
William E. Booker, Acting Cadillac District Geologist

SOUR GAS CONTINGENCY PLAN - PART II  
KALIUM HERSEY #1014  
SECTION 26, T17N, R9W,  
HERSEY TOWNSHIP, OSCEOLA COUNTY, MICHIGAN

RESIDENTS WITHIN 1/4 MILE OF WELLSITE

1. Douglas Dailey  
11431 S. 140th Avenue  
Hersey, MI 49639  
Phone: 616-832-4698

EMERGENCY TELEPHONE NUMBERS

<u>Name</u>	<u>Location</u>	<u>Number</u>
Company Personnel		
Larry Bean	Hersey, MI (Office)	616-832-3755
Don Purvis	Hersey, MI (Office)	616-832-3755
MDNR		
Hal Fitch	Cadillac, MI	616-775-9727
Raymond Vugrinovich	Lansing (Office) (Home)	517-334-6951 517-339-9547
Sheriff	Osceola County	911 or 616-832-2288
State Police	Reed City, MI	911 or 616-832-2221
Ambulance	Alpha 1 N. Patterson Road Reed City, MI 49677	911 or
Hospital	Reed City Hospital N. Patterson Road Reed City, MI 49677	616-832-3271
Fire Department	Hersey, MI	911 or 616-832-3255
Director of Emergency Services Dallas Jenks	Osceola Co. (Office) (Emergency)	616-832-6172 911
Pollution Emergency Alerting System (PEAS)		800-292-4706

SOUR GAS CONTINGENCY PLAN - PART II  
KALIUM - KALIUM HERSEY #1014  
PAGE 2

NEAREST PUBLIC TELEPHONE

The nearest public telephone is located in front of the General Store in the town of Hersey. It is located North 1/2 mile on 140th Avenue, then West 4 miles on Hersey Road to the general store in the town of Hersey, on 180th Avenue.

MUD TREATMENT

A gas buster will be provided.

NOTE: For location of residences, public gathering places and evacuation routes, see vicinity map.



DRILLING PERMIT APPLICATION FLOW SHEET

APPLICANT Kalium Chemicals Ltd NUMBER MW0005

WELL NAME Kalium Hersey #1014 DATE REC'D 6-10-94

VENDOR # \_\_\_\_\_ NEW VENDOR [ ] ORGANIZATIONAL CHART REC'D [ ]

FEE ☒ [x] Ck cashier (Ch#/Bank/City) United State Postal Money Order  
☐ [ ] Deepening ck # 60436444590  
☐ [ ] Revision  
☐ [ ] C & T Tag enclosed

BOND ☒ [x] Single Well [ ] Surety [ ] C.D. [x] L.C. [ ] Cash  
☒ [x] Blanket Bond Number P43087C00008

DRILLING UNIT ☒ [x] S.O. 1-73 [ ] S.O. 1-86 [ ] Statement of control of unit  
☒ [x] 10-12-87 [ ] Sub 330  
☒ [x] General Rules Conflicts  
☒ [x] Field Spacing Order  
☒ [x] Voluntary Pooling [ ] Admin. Approval [ ] Pooling Doc's

MINERAL WELL

LOCATION ☒ [x] Survey [ ] Certification of Elevation to be Run  
☒ [x] Directional Plans  
☒ [x] Posted on Map Zoning NONE [ ] S.I. 2-87

CASING SEALING ☒ [x] Rotary [ ] Cable [ ] Combination  
☒ [x] Int. Csg. S.O. 2-73 [ ] 30% Exception [ ] Short Int Exc  
☒ [x] Through Gas Storage S.O. 1-87  
☒ [x] BOP

OWNED BY KALIUM  
 SURFACE/MINERAL OWNERSHIP ☒ [x] Private Surface, Notified by [x] Statement [ ] Letter  
☒ [x] State Surface  
☒ [x] State Minerals Lease # \_\_\_\_\_ Restrictions \_\_\_\_\_  
☒ [x] Real Estate Emp. Contacted \_\_\_\_\_ Date \_\_\_\_\_  
☒ [x] Real Estate Approval by \_\_\_\_\_ Date \_\_\_\_\_  
☒ [x] Federal [ ] Copy to MMS [ ] Copy to USFS [ ] USFS Approval

H<sub>2</sub>S ☒ [x] Copy to H<sub>2</sub>S Unit [ ] Sweet [x] Sour  
☒ [x] Contingency Plan Acceptable POSSIBLE H<sub>2</sub>S

EIA REVIEW ☒ [x] Special Order 1-81 [x] Supervisor Letter 1-84  
☒ [x] Remote Pit Required [ ] Landowner Approval  
☒ [x] Water Well [x] Temp. [ ] Perm. [ ] Surface [ ] Trucked  
☒ [x] EIA Acceptable Deficiencies TEMP. ON SITE AT - RAIL TO LANDFILL  
☒ [x] Field Review Rec'd EXPANDING EXISTING DRILL PAD  
NO NEW REVIEW NEEDED PER CADILLAC OFFICE

DISTRIB. ☐ [ ] Confidential Request [ ] Copy to Northville, Plymouth, Canton Twp  
☐ [ ] Copy to Subsurface and Petroleum Geology Unit  
☒ [x] Transmittal to District CADILLAC Copy to  
☒ [x] Transmittal to Region

MISC. ☐ [ ] Public Hearing Pending  
☐ [ ] Permits Hold [x] Other Compliance NO  
☐ [ ] Other Problems

REVIEWER: WRL

DATE SENT TO FIELD:  
ISSUED

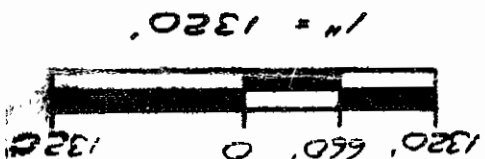
[ ] F.T. ENTRY

*Ready to issue*

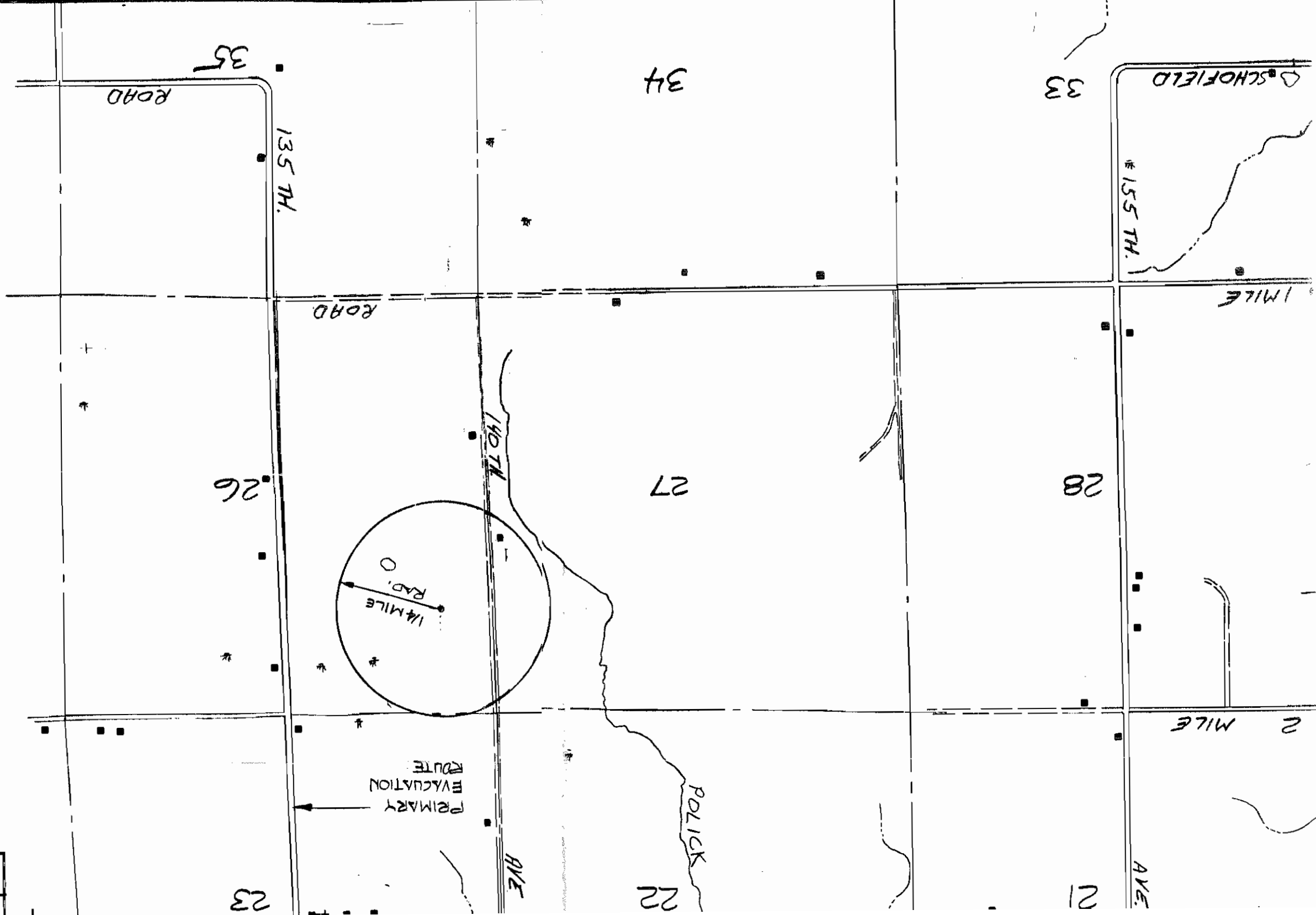


LOCATION MAP

NO SCALE

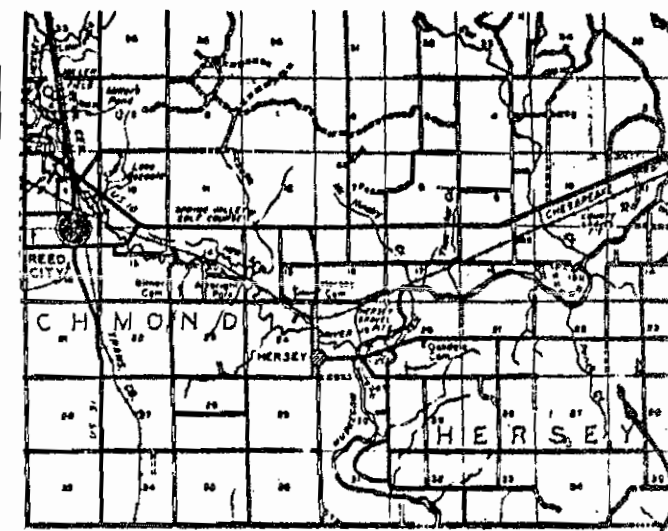
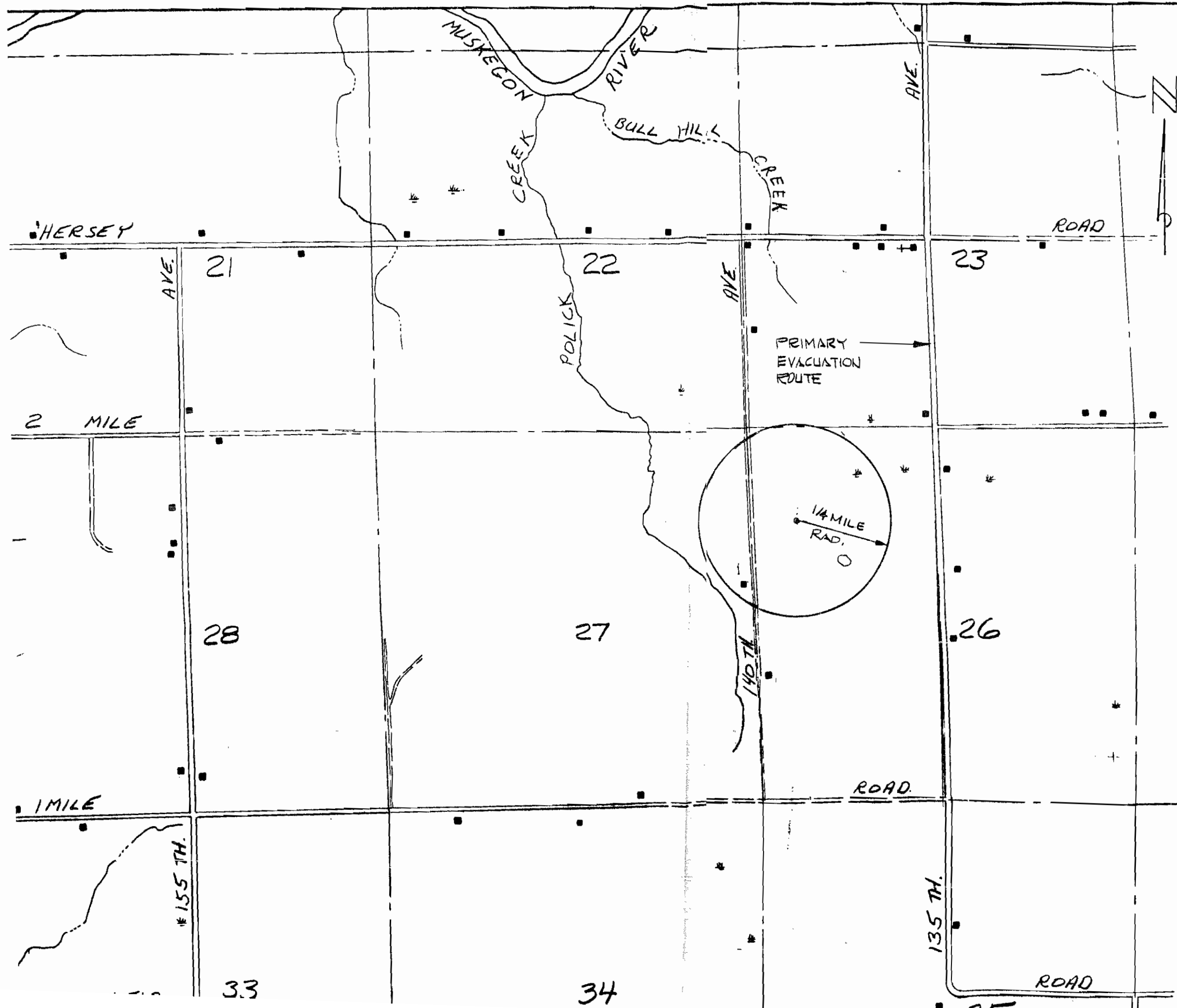


N



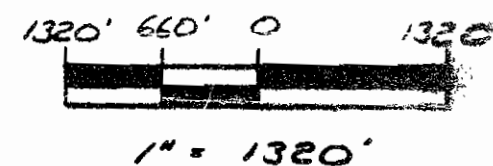
MAP NO.	ISSUE NO.	DATE	4-25-94	DESIGN	TOPO DATA	PROJECT DATA	APPROVED	EDW	VI	H. 1320
MAP DEPICTING RESIDENCES, PUBLIC GATHERING PLACES AND EVACUATION ROUTE @ KALIUM HERSEY #1014 SECTION 26 T17N, R29W, HERSEY TOWNSHIP, OSCOLA COUNTY, MICHIGAN										
CLIENT: KALIUM CHEMICALS, LTD.										

WILCOX Associates, Inc.	7711 South U.S. 131 P.O. Box 580 Cadillac, MI 49801 616 775-7755	TOPO LEVELS	1	OF	1	SHEET	941
-------------------------	---	-------------	---	----	---	-------	-----



LOCATION MAP

NO SCALE





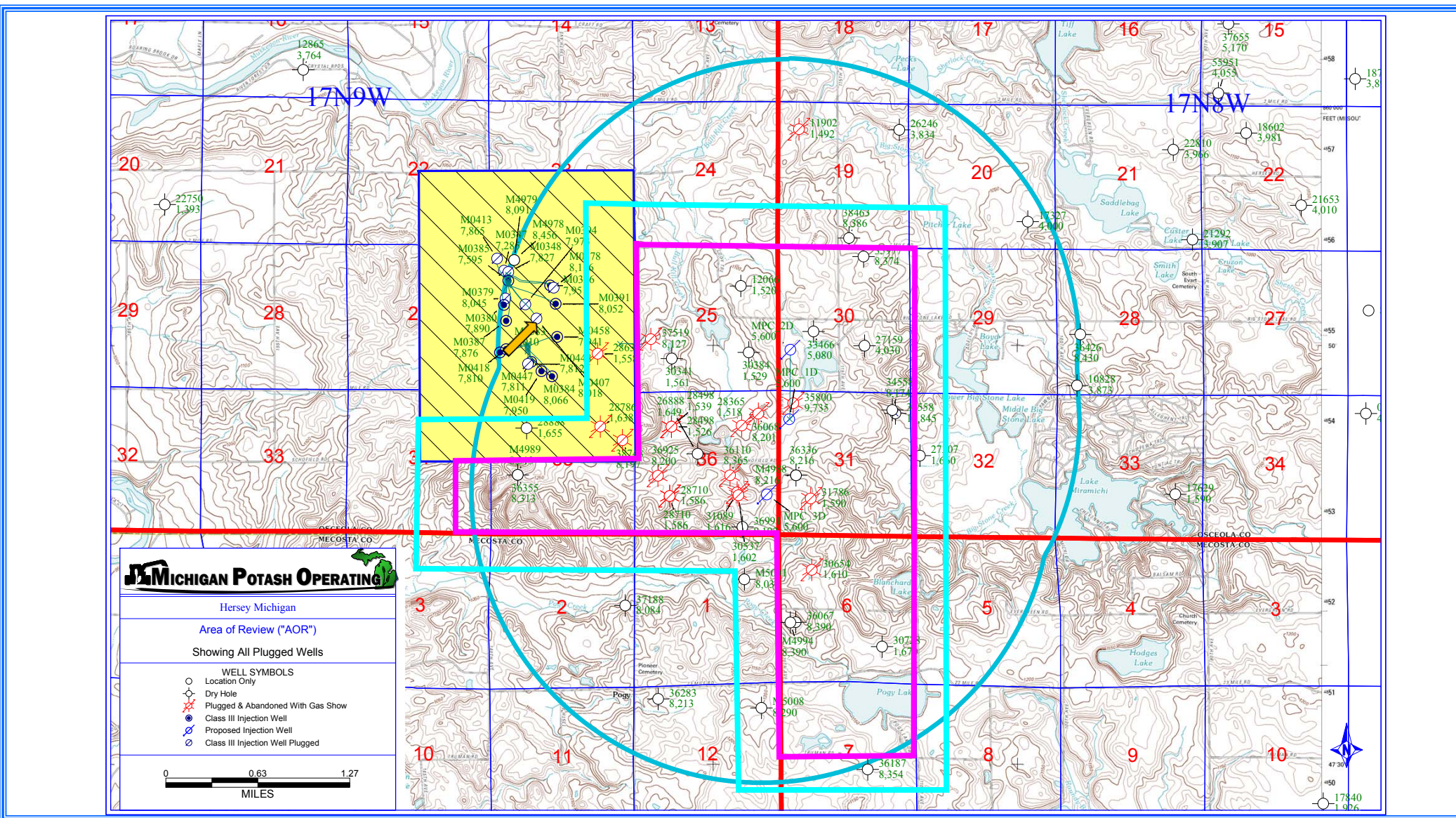
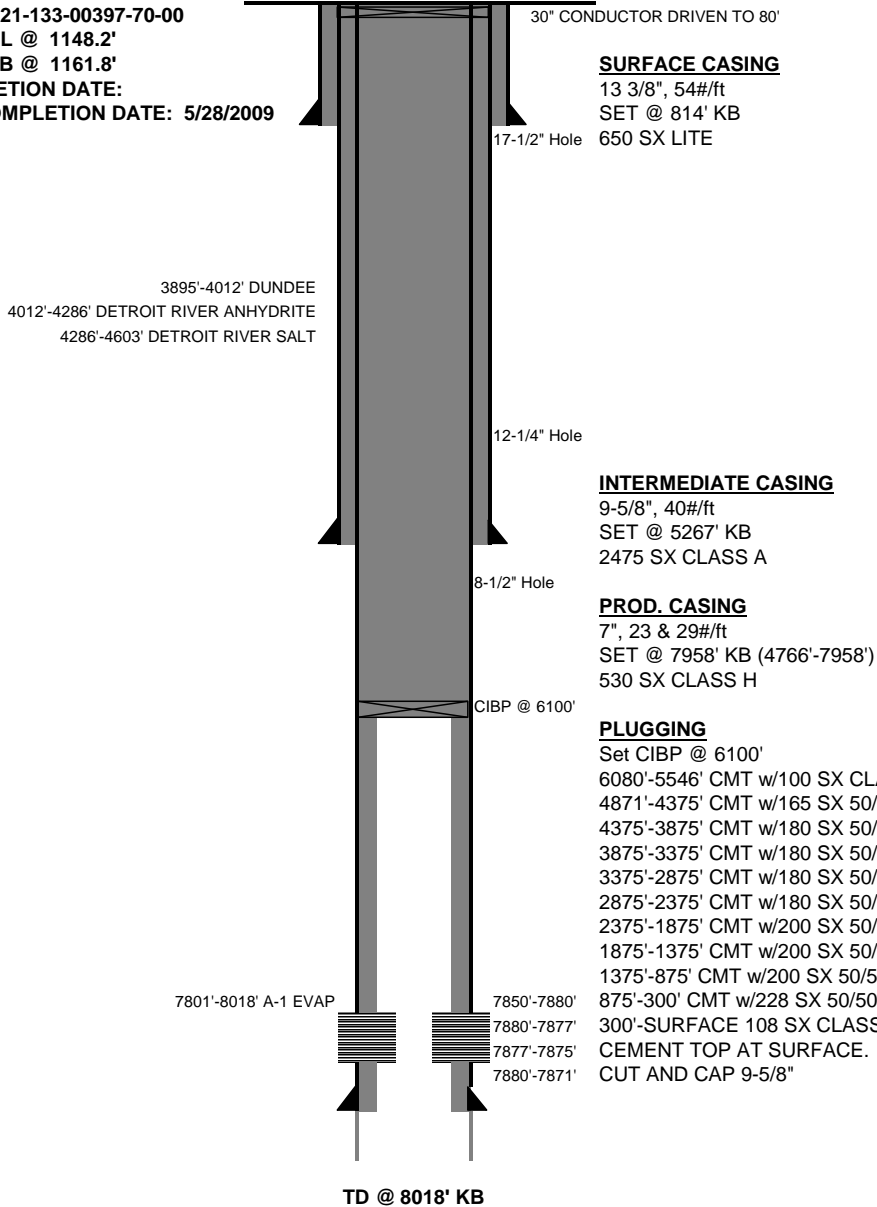


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**KALIUM 1032**  
NW SW NW Sec 26 T17N R9W  
OSCEOLA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

PERMIT No. 00397  
API No. 21-133-00397-70-00  
GL @ 1148.2'  
KB @ 1161.8'  
WELL COMPLETION DATE:  
PLUGGING COMPLETION DATE: 5/28/2009

UPDATED APRIL 2014 BY JLT



**KALIUM 1032 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
10/17/1994	SPUD.
11/15/1994	DRILLING COMPLETED.
	13 3/8" SET AT 814'; 650 SX LITE 9 5/8" SET AT 5267'; 2475 SX CLASS A 7" SET AT 7958'; 530 SX CLASS H
5/20/2009	PLUGGING START DATE SET BIG BOY CIBP @ 6100'
5/21/2009	SET 100 SX CLASS A PLUG @ 6080'
5/22/2009	RUN FREE POINT TOOL AND LOCATE FREE PIPE @ 4770'. JUMP COLLAR AND RETRIEVE 4766' OF 7" CASING CONTACT MARK SMITH (MDEQ). HIS RECOMMENDATION WAS TO SET 2ND PLUG 100' INTO THE 7" CASING
5/27/2009	SET 165 SX PLUG @ 4871'. LAY DOWN PIPE AND SET 180 SX PLUG @ 4375'. LAY DOWN PIPE AND SET 180 SX PLUG @ 3875'. LAY DOWN PIPE AND SET 180 SX PLUG @ 3375'. LAY DOWN PIPE AND SET 180 SX PLUG @ 2875'. LAY DOWN PIPE AND SET 200 SX PLUG @ 2375'. LAY DOWN PIPE AND SET 200 SX PLUG @ 1875'. LAY DOWN PIPE AND SET 200 SX PLUG @ 1375'. LAY DOWN PIPE AND SET 228 SX PLUG @ 875'. LAY DOWN PIPE AND SET 108 SX PLUG @ 300'. CEMENT TOP AT SURFACE. CUT AND CAP 9-5/8".
5/28/2009	PLUGGING COMPLETED.

**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994, as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

- ☐ Part 615 Oil/Gas Well      ☒ Plugging  
☒ Part 625 Mineral Well      ☐ Change of Well Status

Name and address of contractor/service company Mosaic Potash Hersey 1395 135 <sup>th</sup> Ave Hersey, MI 49631		Type of well Solution Mining	Field name Kalium (Mosaic Potash)
		Surface location NW 1/4 SW 1/4 NW 1/4 Sec 26 T 17N R 9W	
		Township Hersey	County Osceola
		Date plugging/change started 5/20/09	Date plugging/change completed 5/28/09
DEQ employee issuing plugging permit or approving Change of Well Status Ray Vugrinovich		Date issued 3/20/2009	
Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse			

WELL PLUGGING (Hole conditions after plugging)							
CASING							
Casing size		Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled			
13 3/8"		814'	0				
9 5/8 "		5267'	0				
7"		4766'-7958'	4766'	4766'			
PLUGS							
Depth of plug Bottom      Top		Make and type of bridge or plug	Cement plugs: type amount of cement & mix water	Additives, type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N
6100'		BIG BOY CIBP				144	
6080'	5546'		100 Sacks Class A		FW/ 41.1 BBL	0	N
4871'	4375'		165 Sacks 50/50 Poz		FW/ 32.4 BBL	0	N
4375'	3875'		180 Sacks 50/50 Poz		FW/ 28.9 BBL	0	N
3875'	3375'		180 Sacks 50/50 Poz		FW/ 25.0 BBL	0	N
3375'	2875'		180 Sacks 50/50 Poz		FW/ 21.3 BBL	0	N
2875'	2375'		180 Sacks 50/50 Poz		FW/ 17.6 BBL	0	N
2375'	1875'		200 Sacks 50/50 Poz		FW/ 13.9 BBL	0	N
1875'	1375'		200 Sacks 50/50 Poz		FW/ 10.2 BBL	0	N
1375'	875'		200 Sacks 50/50 Poz		FW/ 6.5 BBL	0	N
875'	300'		228 Sacks 50/50 Poz		FW/ 2.2 BBL	0	N
<input type="checkbox"/> Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse. <input type="checkbox"/> Check if cores were taken and attach core descriptions							

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well.

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

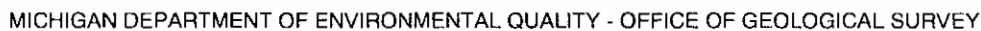
**RECEIVED**

AUG 18 2009

COMPLETE BOTH SIDES

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY





Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994 as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

☐ Part 615 Oil/Gas Well      ☒ Plugging  
☒ Part 625 Mineral Well      ☐ Change of Well Status

Permit number	Well name and number
397-855-767	Kalium 1032 (Mosaic)
API number	
MI-133-3G-A002	
Name and address of permittee	
Mosaic Potash Hersey	
1395 135 <sup>th</sup> Ave	
Hersey MI 49639	

Name and address of contractor/service company

Mosaic Potash Hersey  
1395 135<sup>th</sup> Ave  
Hersey, MI 49631

Type of well	Field name
Solution Mining	Kalium (Mosaic Potash)
Surface location	
NW 1/4 SW 1/4 NW 1/4	Sec 26 T 17N R 9W
Township	County
Hersey	Osceola
Date plugging/change started	Date plugging/change completed
5/20/09	5/28/09

DEQ employee issuing plugging permit or approving Change of Well Status

Ray Vugrinovich

Date issued

3/20/2009

Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse.

### WELL PLUGGING

(Hole conditions after plugging)

## CASING

Casing size	Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled
13 3/8"	814'	0	
9 5/8 "	5267'	0	
7"	4766'-7958'	4766'	4766'

## PLUGS

[illegible]

☐ Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse.

☐ Check if cores were taken and attach core descriptions

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

RECEIVED

AUG 18 2009

COMPLETE BOTH SIDES

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

API number MI-133-3G-A002	Permit number 397-855-767
------------------------------	------------------------------

### CHANGE OF WELL STATUS

Change was to:	<input type="checkbox"/> Convert current zone to:	<input type="checkbox"/> Remediate well:	<input type="checkbox"/> Plugback (recomplete as)	<input type="checkbox"/> Redrill:
	<input type="checkbox"/> Production	<input type="checkbox"/> Perf and test existing zone	<input type="checkbox"/> New production zone	<input type="checkbox"/> Horizontal drain hole
	<input type="checkbox"/> Disposal	<input type="checkbox"/> Repair casing/cement	<input type="checkbox"/> Disposal	<input type="checkbox"/> Collapsed casing
	<input type="checkbox"/> Secondary recovery	<input type="checkbox"/> Other _____	<input type="checkbox"/> Secondary recovery	<input type="checkbox"/> Underream open hole
	<input type="checkbox"/> Storage		<input type="checkbox"/> Storage	
	<input type="checkbox"/> Other _____		<input type="checkbox"/> Other _____	<input type="checkbox"/> Other _____

### Well casing record - BEFORE change

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well casing record - AFTER change (Indicate additions and changes only, complete test record)

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

#### BEFORE CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

#### AFTER CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

#### DAILY PRODUCTION TEST RECORD

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure	
				Tubing	Casing

#### DAILY INJECTION TEST RECORD ☐ Injection well ☐ Brine disposal

Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
		Beginning	Ending	

### DAILY CHRONOLOGY

**RECEIVED**

Describe in detail the daily chronology of change/plugging, include days shut down. Describe exceptions to issued plugging instructions. Describe tools tubing etc left in hole and any logs run. Include dates pits filled, surface restored etc. Use additional pages as needed.

Date	Narrative
5/20/09	Set Big Boy Cast iron bridge plug @ 6100'
5/21/09	Set 100 Sack Class A plug @ 6080'
5/22/09	Run free point tool and locate free pipe @ 4770'. Jump collar and retrieve 4766' of 7" casing. Contact Mark Smith (MDEQ). His recommendation was to set 2 <sup>nd</sup> plug 100' into the 7" casing.
5/27/09	Set 165 sack plug @ 4871'. Lay down pipe and set 180 sack plug @ 4375'. Lay down pipe and set 180 sack plug @ 3875'. Lay down pipe and set 180 sack plug @ 3375'. Lay down pipe and set 180 sack plug @ 2875'. Lay down pipe and set 200 sack plug @ 2375'. Lay down pipe and set 200 sack plug @ 1875'. Lay down pipe and set 200 sack plug @ 1375'. Lay down pipe and set 228 sack plug @ 875'. Lay down pipe and set 108 sack plug @ 300'.
5/28/09	

AUG 18 2009

**ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY**

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge.

Name and title (printed or typed) William Hicks Minefield Supervisor	Authorized signature 	Date 6/22/09
---	--------------------------	-----------------

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.

API number  
MI-133-3G-A002

Permit number  
397-855-767

### CHANGE OF WELL STATUS

Change was to: ☐ Convert current zone to: ☐ Remediate well: ☐ Plugback (recomplete as) ☐ Redrill:

☐ Production ☐ Perf and test existing zone ☐ New production zone ☐ Horizontal drain hole

☐ Disposal ☐ Repair casing/cement ☐ Disposal ☐ Collapsed casing

☐ Secondary recovery ☐ Other ☐ Secondary recovery ☐ Underream open hole

☐ Storage ☐ Other ☐ Storage ☐ Other

☐ Other ☐ Other

### Well casing record - BEFORE change

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well casing record - AFTER change (Indicate additions and changes only, complete test record)

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### BEFORE CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

### AFTER CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

### DAILY PRODUCTION TEST RECORD

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure	
				Tubing	Casing

### DAILY INJECTION TEST RECORD ☐ Injection well ☐ Brine disposal

Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
		Beginning	Ending	

### DAILY CHRONOLOGY

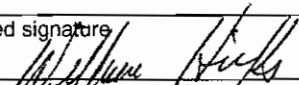
Describe in detail the daily chronology of change/plugging, include days shut down Describe exceptions to issued plugging instructions Describe tools tubing, etc left in hole and any logs run Include dates pits filled, surface restored etc Use additional pages as needed

Date	Narrative
5/28/09	Cement top at surface Cut and cap 9 5/8".

**RECEIVED**  
AUG 18 2009  
ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION I state that I am authorized by said owner This report was prepared under my supervision and direction The facts stated herein are true accurate and complete to the best of my knowledge

Name and title (printed or typed) William Hicks Minefield Supervisor	Authorized signature 	Date 6/22/09
---	--	-----------------

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D C 20460**PLUGGING AND ABANDONMENT PLAN****Name and Address of Facility**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, Mi 49639**Name and Address of Owner/Operator**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, Mi 49639

State

Mich

County

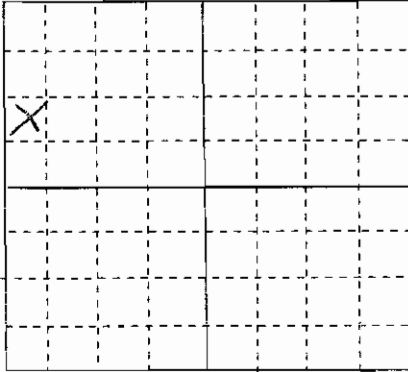
Osceola

Permit Number

MI-133-3G-A002

Locate Well and Outline Unit on  
Section Plat - 640 Acres

N



Surface Location Description

NW 1/4 of SW 1/4 of NW 1/4 of Section 26 T17N R9W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 1274 ft From (N/S) S Line of Quarter Section

And 660 ft From (E/W) W Line of Quarter Section

**TYPE OF AUTHORIZATION**☐ Individual Permit☒ Area Permit☐ Rule

Number of Wells 19

Lease Name Kalium (Mosaic Potash)

**WELL  
ACTIVITY**☐ Class I☐ Hazardous☐ Nonhazardous☐ Class II☐ Brine Disposal☐ Enhanced Recovery☐ Hydrocarbon Storage☒ Class III

Well Number 1032

**CASING AND TUBING RECORD AFTER PLUGGING**

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
13 3/8	54		814	17 1/2
9 5/8	40		5267	12 1/4
7	23		4766-7958	8 1/2

**METHOD OF EMPLACEMENT OF CEMENT PLUGS**☒ Balance Method☐ Dump Bailer Method☐ Two Plug Method☐ Other**CEMENT TO PLUG AND ABANDON DATA:**

	Plug #1	Plug #2	Plug #3	Plug #4	Plug #5	Plug #6	Plug #7
Size of Hole or Pipe in Which Plug Will Be Placed (inches)	7"	7" and 9 5/8"	9 5/8"	9 5/8"	9 5/8"	9 5/8"	9 5/8"
Depth to Bottom of Tubing or Drill Pipe (ft)	6080	4871	4375	3875	3375	2875	2375
Sacks of Cement To Be Used (each plug)	100	165	180	180	180	180	200
Slurry Volume To Be Pumped (cu. Ft.)	118.5	172	186.9	186.9	186.9	186.9	212.7
Calculated Top of Plug (ft.)	5546	4375	3875	3375	2875	2375	1875
Measured Top of Plug (if tagged, ft.)	5546						
Slurry Weight (Lb./Gal.)	15.6	15	15	15	15	15	15
Type of Cement or Other Material (Class III)	Class A	50/50 Poz	50/50 Poz	50/50 Poz	50/50 Poz	50/50 Poz	50/50 Poz

**LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)**

From	To	From	To

Estimated Cost to Plug Wells

\$100,000

**CERTIFICATION**

I certify under the penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref 40 CFR 144.32)

Name and Official Title (Please type or print)

William Hicks Minefield Supervisor

Signature

Date Signed

6/24/2009

EPA Form 7520-14 (Rev 8-01)

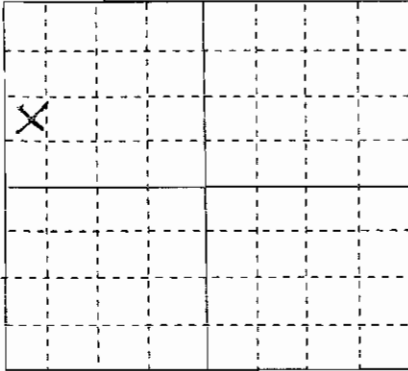
**RECEIVED**

AUG 18 2009

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460**PLUGGING AND ABANDONMENT PLAN****Name and Address of Facility**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, Mi 49639**Name and Address of Owner/Operator**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, Mi 49639Locate Well and Outline Unit on  
Section Plat - 640 Acres

N



State

Mich

County

Osceola

Permit Number

MI-133-3G-A002

Surface Location Description

NW 1/4 of SW 1/4 of NW 1/4 of Section 26 T17N R9W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 1274 ft From (N/S) S Line of Quarter Section

And 660 ft From (E/W) W Line of Quarter Section

**TYPE OF AUTHORIZATION**☐ Individual Permit☒ Area Permit☐ Rule

Number of Wells 19

Lease Name Kalium (Mosaic Potash)

**WELL  
ACTIVITY**☐ Class I☐ Hazardous☐ Nonhazardous☐ Class II☐ Brine Disposal☐ Enhanced Recovery☐ Hydrocarbon Storage☒ Class III

Well Number 1032

**CASING AND TUBING RECORD AFTER PLUGGING**

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
13 3/8	54		814	17 1/2
9 5/8	40		5267	12 1/4
7	23		4766-7958	8 1/2

**METHOD OF EMPLACEMENT OF CEMENT PLUGS**☒ Balance Method☐ Dump Bailer Method☐ Two Plug Method☐ Other**CEMENT TO PLUG AND ABANDON DATA:**

	Plug #8	Plug #9	Plug #10	Plug #11			
Size of Hole or Pipe in Which Plug Will Be Placed (inches)	9 5/8"	9 5/8"	9 5/8"	9 5/8"			
Depth to Bottom of Tubing or Drill Pipe (ft)	1875	1375	875	300			
Sacks of Cement To Be Used (each plug)	200	200	228	108			
Slurry Volume To Be Pumped (cu. Ft.)	212.7	212.7	244.2	127.4			
Calculated Top of Plug (ft.)	1375	875	300	Surface			
Measured Top of Plug (if tagged, ft.)				Surface			
Slurry Weight (Lb./Gal.)	15	15	15	15.6			
Type of Cement or Other Material (Class III)	50/50 Poz	50/50 Poz	50/50 Poz	Class A			

**LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)**

From

To

From

To

Estimated Cost to Plug Wells

\$100,000

**RECEIVED**

AUG 18 2009

**CERTIFICATION**ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

I certify under the penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

William Hicks Minefield Supervisor

Signature

Date Signed

6/24/2009



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

## FIELD PLUGGING SUMMARY

COMPANY 1110-2110 DATE 7/1/09 JOB #       

WELL NAME Hessing Street NO 101

LOCATION        COUNTY Washtenaw STATE MI TWP.       

CONTRACTORS NAME 1110-2110

JOB DESCRIPTION Plug to 176' down

PLUG TO ABANDON	PLUG # 1	PLUG #	PLUG #	PLUG #	PLUG #	PLUG #
SIZE OF PIPE IN HOLE	7"					
CALCULATED TOP OF PLUG FT.	5546					
DEPTH TO BOTTOM OF PLUG FT.	6080					
SACKS OF CEMENT USED	100					
SLURRY VOLUME USED BBLs	21					
TYPE OF CEMENT USED	A					
AVER. SLURRY WT. LB./GAL.	156					
TYPE OF SPACE USED	FW					
FEET OF FILL IN HOLE	534					
SIZE OF TUBING USED	3 1/2					
TUBING VOLUME DISP. BBL.	41.1					

SQUEEZE DATA        DEPTH OF SQUEEZE ENTRY       

NO. OF SACKS SQUEEZED        MAX PSI OF SQUEEZE       

PROCEDURE USED Big 4 3/4" Drill Pipe & Drill Collars 4/Rings And 100' FW Ahead Spot 100% Class Cement 6080 w/ 41 BBLs Being Drilled Down

**RECEIVED**

AUG 18 2009

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

TOTAL MATERIAL USED 100 1/2 Class Cement

DATE OF JOB COMPLETED 5-21-09 TICKET NO 2903

PUMP # 156 BULK #       

CEMENTER JR STARK

COMMENTS       

THANK YOU!



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

2905

## FIELD INVOICE

Company Moscow Date 5-21-09

Send Invoice To \_\_\_\_\_ P/N# \_\_\_\_\_

Address \_\_\_\_\_ Job # \_\_\_\_\_

Lease Name Honey Plant No. 1211 Lease # 1032

Contractors Name Midstate Bill Hooks

State MI County Osceola Twp \_\_\_\_\_ Section \_\_\_\_\_

Open Hole Size \_\_\_\_\_ In Stop Plug At \_\_\_\_\_ Ft.

Casing Size \_\_\_\_\_ In Depth \_\_\_\_\_ Ft.

No Sacks Cement 1010 Per Sack \$ 1.10 Price \$ 1,110

No Sacks 65/35 \_\_\_\_\_ Per Sack \$ \_\_\_\_\_ Price \$ \_\_\_\_\_

Sacks Chloride \_\_\_\_\_ Per Sack \$ \_\_\_\_\_ Price \$ \_\_\_\_\_

No Gals HCL \_\_\_\_\_ % \_\_\_\_\_ Per Gal \_\_\_\_\_ Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Cu. Ft. Handling Charge @ \$ 1.00 x 100 Price \$ 100.00

Hauling 9400 # Tons x 4.7 Miles

At \$ 1.50 Per/Ton Mile 56 Price \$ 394.30

Pump Truck Service Charge \_\_\_\_\_ Price \$ 3,000.00

Pump Truck Mileage 1 Truck 112 miles x 2.50/mile Price \$ 308.00

Comments: 1.75 x 100 = 175.00

Total \$ 4,952.80

Max PSI 1100

Arrive on Loc. 5-21-09 Start 0700

Complete Job 5-21-09 1030

Cementer JD Smith Operator Mike T. D.

RECEIVED

AUG 18 2009

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

Customer Signature \_\_\_\_\_ Date 5/21/09





# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

## FIELD PLUGGING SUMMARY

COMPANY Mesa DATE 5 27 09 JOB #

WELL NAME P. 1 NO # 1132

LOCATION  COUNTY Oakland STATE MI TWP. Hussey

CONTRACTORS NAME Billy Mack

JOB DESCRIPTION plug to abandon

PLUG TO ABANDON	PLUG # 1	PLUG #	PLUG #	PLUG #	PLUG #	PLUG #
SIZE OF PIPE IN HOLE	7" 9/8	7/8	9/8	7/8	9/8	
CALCULATED TOP OF PLUG FT.	1375	3375	3375	2875	2375	
DEPTH TO BOTTOM OF PLUG FT.	1871	375	3828	1375	1875	
SACKS OF CEMENT USED	165	140	180	180	120	
SLURRY VOLUME USED BBLs	20.5	33.1	23.3	33.3	33.3	
TYPE OF CEMENT USED	50/50	50/50	50/50	50/50	50/50	
AVER. SLURRY WT. LB./GAL.	13	12	15	15	15	
TYPE OF SPACE USED	FW	FW	FW	FW	FW	
FEET OF FILL IN HOLE	796	500	500	500	500	
SIZE OF TUBING USED	37	37	37	37	37	
TUBING VOLUME DISP. BBL.	32.1	22.4	25	21.3	12.6	

SQUEEZE DATA  DEPTH OF SQUEEZE ENTRY

NO OF SACKS SQUEEZED  MAX PSI OF SQUEEZE

PROCEDURE USED Break circulation Pump 11 BBL FW After 11:00 pump

165 sa 50/50 replace to 1375 TOH to 4375 Break circulation

pump 11 BBL FW plug pump 120 sa 50/50 plug 2nd round

and Report 3 min later pulling 500' Each time

Top of last plug is 2375 After last plug pulled 3:11:15

12:11 plug in 12:15 am

TOTAL MATERIAL USED 255 sa 50/50

1375 to 2375

DATE OF JOB COMPLETED 5 27 09 TICKET NO 2892

PUMP # 438 BULK # 50/50 50/70

CEMENTER B. H. Russell

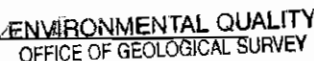
COMMENTS

RECEIVED

AUG 18 2009

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

THANK YOU!





# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

2893

## FIELD INVOICE

Company MDS, INC Date 5-28-09

Send Invoice To \_\_\_\_\_ P/N# \_\_\_\_\_

Address \_\_\_\_\_ Job # \_\_\_\_\_

Lease Name Port 1, 11 Lease # 1032

Contractors Name B.H. H. & S

State MI County Oscoda Twp H. & S Section \_\_\_\_\_

Open Hole Size \_\_\_\_\_ In Stop Plug At \_\_\_\_\_ Ft

Casing Size 9 5/8 plugged 11.00 3 1/2 DP In Depth \_\_\_\_\_ Ft

No Sacks Cement 108 Per Sack \$ 11.50 Price \$ 1242.00

No Sacks 65/35 50/50 710 Per Sack \$ 11.50 Price \$ 8165.00

Sacks Chloride \_\_\_\_\_ Per Sack \$ \_\_\_\_\_ Price \$ \_\_\_\_\_

No Gals HCL \_\_\_\_\_ % \_\_\_\_\_ Per Gal \_\_\_\_\_ Price \$ \_\_\_\_\_

250 Sugar \$2.00 LB Price \$ 50.00

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Cu. Ft. Handling Charge @ \$ 1.00 x 848 Price \$ 848.00

Hauling 35.5 # Tons x 55 Miles \_\_\_\_\_

At \$ 1.50 Per/Ton Mile \_\_\_\_\_ Price \$ 2928.75

Pump Truck Service Charge 1st 6 hrs. on loc. 5000.00 5000.00 Price \$ 0 N/C

Pump Truck Mileage RT 55 x 2 x 2 75 Price \$ 302.50

Comments: plugged 11.00 3 1/2 DP

108 50/50

250 Sugar

108 50/50

108 50/50

108 50/50

108 50/50

108 50/50

108 50/50

108 50/50

108 50/50

108 50/50

108 50/50

108 50/50

Total \$ 13881.25

Max PSI 300

Arrive on Loc. 8:00 am Start 8:15 am

Complete Job 4:00 pm 5-28-09

Cementer B.H. H. & S Operator John H. (108 11)

RECEIVED

Customer Signature [Signature] Date 5/28/09

AUG 18 2009

ENVIRONMENTAL QUALITY



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

## FIELD PLUGGING SUMMARY

COMPANY MOSBY DATE 5-28-09 JOB #

WELL NAME Pol 12 H NO 1032

LOCATION  COUNTY Oscoda STATE MI TWP Hershey

CONTRACTORS NAME Sally H. Co.

JOB DESCRIPTION Plug to Abandon

PLUG TO ABANDON	PLUG #	PLUG #	PLUG #	PLUG #	PLUG #	PLUG #
SIZE OF PIPE IN HOLE	9 7/8	9 7/8	9 7/8	9 7/8	9 7/8	
CALCULATED TOP OF PLUG FT.	1875	1375	875	300	SUR	
DEPTH TO BOTTOM OF PLUG FT.	2375	1875	1375	875	300	
SACKS OF CEMENT USED	200	200	200	228	108	
SLURRY VOLUME USED BBLs	37.9	37.9	37.9	43.5	22.7	
TYPE OF CEMENT USED	50/50	50/50	50/50	50/50	A	
AVER. SLURRY WT. LB./GAL.	15	15	15	15	15.6	
TYPE OF SPACE USED	FW	FW	FW	FW	FW	
FEET OF FILL IN HOLE	500	500	500	575	300	
SIZE OF TUBING USED	3 1/2 DP	3 1/2 DP	3 1/2 DP	3 1/2 DP	3 1/2 DP	
TUBING VOLUME DISP. BBL	13.9	10.2	6.5	2.2	-	

SQUEEZE DATA  DEPTH OF SQUEEZE ENTRY

NO. OF SACKS SQUEEZED  MAX PSI OF SQUEEZE

PROCEDURE USED TB6 2375 Break Circulation mix w pump 200 ss 50/50 por

TB6 1875 Break Circulation mix w pump 200 ss 50/50 por

TB6 1375 Break Circulation mix w pump 200 ss 50/50 por

TB6 875 Break Circulation mix w pump 228 ss 50/50 por

TB6 300 Break Circulation mix w pump 108 ss Class A F.

Surface Used 25 lbs. Sugar on pit Clean up off location

TOTAL MATERIAL USED 328 50/50 por Blend

108 ss. Class A

25 # Sugar

DATE OF JOB COMPLETED  TICKET NO 7893

PUMP # 138 BULK # SS / 392 591 / 703

CEMENTER B. H. Russell

COMMENTS 38 ss cement changed from day before field on location

RECEIVED

AUG 18 2009

THANK YOU!

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

## FIELD PLUGGING SUMMARY

COMPANY 1-10-09 DATE 1-10-09 JOB #

WELL NAME 140-14-1-10-1 NO 100

LOCATION  COUNTY 13 STATE MI TWP

CONTRACTORS NAME 140-14-1-10-1

JOB DESCRIPTION plug to 140-14-1-10-1

PLUG TO ABANDON	PLUG # 1	PLUG #	PLUG #	PLUG #	PLUG #	PLUG #
SIZE OF PIPE IN HOLE	7"					
CALCULATED TOP OF PLUG FT.	5544					
DEPTH TO BOTTOM OF PLUG FT.	6080					
SACKS OF CEMENT USED	100					
SLURRY VOLUME USED BBLs	21					
TYPE OF CEMENT USED	14					
AVER. SLURRY WT. LB./GAL.	15.6					
TYPE OF SPACE USED	FW					
FEET OF FILL IN HOLE	534					
SIZE OF TUBING USED	3 1/2					
TUBING VOLUME DISP. BBL.	41.1					

SQUEEZE DATA  DEPTH OF SQUEEZE ENTRY

NO. OF SACKS SQUEEZED  MAX PSI OF SQUEEZE

PROCEDURE USED Plug to 140-14-1-10-1 with 100% cement slurry 6080 w/ 41.1 bbls  
FW Ahead Spot 100% cement slurry 6080 w/ 41.1 bbls  
Being drilled down

TOTAL MATERIAL USED 100 1 1/2 bbls cement

DATE OF JOB COMPLETED 1-21-09 TICKET NO. 2707

PUMP # 156 BULK #

CEMENTER JR Smith

COMMENTS

**RECEIVED**

AUG 18 2009

THANK YOU!

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

2905

## FIELD INVOICE

Company Midstate Date 7-21-09

Send Invoice To \_\_\_\_\_ P/N# \_\_\_\_\_

Address \_\_\_\_\_ Job # \_\_\_\_\_

Lease Name Honey Creek 10-11 Lease # 1032

Contractors Name Midstate Well Works

State MI County Oscoda Twp \_\_\_\_\_ Section \_\_\_\_\_

Open Hole Size \_\_\_\_\_ In Stop Plug At \_\_\_\_\_ Ft.

Casing Size \_\_\_\_\_ In Depth \_\_\_\_\_ Ft.

No Sacks Cement 100 Per Sack \$ 11.50 Price \$ 1,150

No. Sacks 65/35 \_\_\_\_\_ Per Sack \$ \_\_\_\_\_ Price \$ \_\_\_\_\_

Sacks Chloride \_\_\_\_\_ Per Sack \$ \_\_\_\_\_ Price \$ \_\_\_\_\_

No Gals HCL \_\_\_\_\_ % \_\_\_\_\_ Per Gal \_\_\_\_\_ Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Cu. Ft Handling Charge @ \$ 1.00 x 100 Price \$ 100.00

Hauling 9400 # Tons x 4.7 Miles

At \$ 1.50 Per/Ton Mile 56 Price \$ 394.50

Pump Truck Service Charge \_\_\_\_\_ Price \$ 3,000

Pump Truck Mileage 1 Truck 112 miles x 2.50/mile Price \$ 308.00

Comments: 1.7M 112 miles x 2.50/mile

Total \$ 4,952.50

Max PSI 1000

Arrive on Loc 7-21-09 Start 0700

Complete Job 7-21-09 AUG 18 2009

Cementor John Smith Operator John Smith

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

Customer Signature \_\_\_\_\_ Date 7/21/09

RECEIVED



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

## FIELD PLUGGING SUMMARY

COMPANY 11/03/01 DATE 5 27 07 JOB #

WELL NAME P. 1. 1 NO # 11.32

LOCATION  COUNTY OShtola STATE MI TWP. 11.32

CONTRACTORS NAME B. 11. 1

JOB DESCRIPTION plug to abandon

PLUG TO A BANDON	PLUG # 1	PLUG #	PLUG #	PLUG #	PLUG #	PLUG #
SIZE OF PIPE IN HOLE	7" 9 1/2	7 1/2	7 1/2	7 1/2	7 1/2	
CALCULATED TOP OF PLUG FT.	1375	1375	1375	1375	1375	
DEPTH TO BOTTOM OF PLUG FT.	1375	1375	1375	1375	1375	
SACKS OF CEMENT USED	115	130	130	130	130	
SLURRY VOLUME USED BBLs	11.5	33.3	33.3	33.3	33.3	
TYPE OF CEMENT USED	50/50	50/50	50/50	50/50	50/50	
AVER. SLURRY WT. LB./GAL.	15	15	15	15	15	
TYPE OF SPACE USED	FW	FW	FW	FW	FW	
FEET OF FILL IN HOLE	756	500	500	500	500	
SIZE OF TUBING USED	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	
TUBING VOLUME DISP. BBL.	32.1	1.4	1.5	21.3	11.6	

SQUEEZE DATA DEPTH OF SQUEEZE ENTRY

NO. OF SACKS SQUEEZED MAX PSI OF SQUEEZE

PROCEDURE USED Break circulation Pump 11.32 FW 11.32 11.32

165 cc 50/50 displac 11.325 TOH to 4375 Break circulation

pump 11.32 FW 11.32 11.32 11.32 50/50 per brand

and Repeat 3 more times pull 500' each time

Top of last plug is 2375 After last plug pulled 3.1 11.3

with 11.32 11.32 11.32

TOTAL MATERIAL USED 555 cc 50/50

11.32 11.32 11.32

DATE OF JOB COMPLETED 5 27 07 TICKET NO. 2592

PUMP # 438 BULK # 25/3. 391/7.3

CEMENTER B. 11. Russell

COMMENTS

RECEIVED

AUG 18 2009

THANK YOU!

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY





# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

2892

## FIELD INVOICE

Company 11/05/09 Date 5 22 09

Send Invoice To \_\_\_\_\_ P/N# \_\_\_\_\_

Address \_\_\_\_\_ Job # \_\_\_\_\_

Lease Name Pet Ash Lease # 1032

Contractors Name 3.11.11 HCL

State MI County Calhoun Twp Holly Section \_\_\_\_\_

Open Hole Size \_\_\_\_\_ In Stop Plug At \_\_\_\_\_ Ft

Casing Size \_\_\_\_\_ In Depth \_\_\_\_\_ Ft

No Sacks 50/50 Cement 555 Per Sack \$ 11.50 Price \$ 10177.50

No Sacks 65/35 \_\_\_\_\_ Per Sack \$ \_\_\_\_\_ Price \$ \_\_\_\_\_

Sacks Chloride \_\_\_\_\_ Per Sack \$ \_\_\_\_\_ Price \$ \_\_\_\_\_

No Gals HCL \_\_\_\_\_, % \_\_\_\_\_, Per Gal \_\_\_\_\_ Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Cu Ft Handling Charge @ \$ 1.00 X 585 Price \$ 585.00

Hauling 28.5 # Tons x 55 Miles

At \$ 1.50 Per/Ton Mile Price \$ 2351.25

Pump Truck Service Charge Price \$ 300.00

Pump Truck Mileage RT 55 miles x 2 x 2.75 Price \$ 302.50

Comments: plug well from 4371 to 2373

with 555 sc 50/50 per well

Total \$ 16716.25

RECEIVED

Max PSI 1000

Arrive on Loc 11:00 AM Start 16:00 AM AUG 18 2009

Complete Job 2.00 PM

Cementer 12.11.12 Operator 12.11.12

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

Customer Signature [Signature] Date 5 22 09



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

2893

## FIELD INVOICE

Company MIDSTATE Date 5-28-09

Send Invoice To \_\_\_\_\_ P/N# \_\_\_\_\_

Address \_\_\_\_\_ Job # \_\_\_\_\_

Lease Name Pat 1211 Lease # 1032

Contractors Name B.H. Hicks

State MI County Oscoda Twp. Hickory Section \_\_\_\_\_

Open Hole Size \_\_\_\_\_ In. Stop Plug At \_\_\_\_\_ Ft

Casing Size 7 5/8 plugged below 3 1/2 DP In Depth \_\_\_\_\_ Ft

No Sacks Cement 108 Per Sack \$ 11.50 Price \$ 1242.00

No Sacks ~~65/35~~ 50/50 710 Per Sack \$ 11.50 Price \$ 8165.00

Sacks Chloride \_\_\_\_\_ Per Sack \$ \_\_\_\_\_ Price \$ \_\_\_\_\_

No Gals HCL \_\_\_\_\_ % Per Gal \_\_\_\_\_ Price \$ \_\_\_\_\_

25 Seal 2.00 WD Price \$ 50.00

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Price \$ \_\_\_\_\_

Cu Ft Handling Charge @ \$ 1.00 x 848 Price \$ 848.00

Hauling 35.5 # Tons x 55 Miles

At \$ 1.50 Per/Ton Mile Price \$ 2928.75

Pump Truck Service Charge 1.1 6 hrs on loc 5600 5.125 Price \$ 0 N/C

Pump Truck Mileage RT 55 x 2 x 2.25 Price \$ 302.50

Comments: all work done with 11034 50/50 pot

1108 11034

Total \$ 13881.25

Max PSI 300 Thank You

Arrive on Loc 8:00 am Start 8:15 am

Complete Job 4:00 pm 5-28-09

Cementer Don Operator John A. Givens

RECEIVED

Customer Signature [Signature] Date 5/28/09



**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994, as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

- ☐ Part 615 Oil/Gas Well      ☒ Plugging  
☒ Part 625 Mineral Well      ☐ Change of Well Status

Name and address of contractor/service company Mosaic Potash Hersey 1395 135 <sup>th</sup> Ave Hersey, MI 49631		Type of well Solution Mining	Field name Kalium (Mosaic Potash)	
		Surface location NW 1/4 SW 1/4 NW 1/4	Sec 26	T 17N R 9W
		Township Hersey	County Osceola	
		Date plugging/change started 5/20/09	Date plugging/change completed 5/28/09	
DEQ employee issuing plugging permit or approving Change of Well Status Ray Vuqrinovich			Date issued 3/20/2009	
Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse				

WELL PLUGGING (Hole conditions after plugging)						
CASING						
Casing size	Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled			
13 3/8"	814'	0				
9 5/8 "	5267'	0				
7"	4766'-7958'	4766'	4766'			
PLUGS						
Depth of plug Bottom      Top	Make and type of bridge or plug	Cement plugs: type amount of cement & mix water	Additives type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N
	6100'	BIG BOY CIBP			144	
6080'	5546'	100 Sacks Class A		FW/ 41.1 BBL	0	N
4871'	4375'	165 Sacks 50/50 Poz		FW/ 32.4 BBL	0	N
4375'	3875'	180 Sacks 50/50 Poz		FW/ 28.9 BBL	0	N
3875'	3375'	180 Sacks 50/50 Poz		FW/ 25.0 BBL	0	N
3375'	2875'	180 Sacks 50/50 Poz		FW/ 21.3 BBL	0	N
2875'	2375'	180 Sacks 50/50 Poz		FW/ 17.6 BBL	0	N
2375'	1875'	200 Sacks 50/50 Poz		FW/ 13.9 BBL	0	N
1875'	1375'	200 Sacks 50/50 Poz		FW/ 10.2 BBL	0	N
1375'	875'	200 Sacks 50/50 Poz		FW/ 6.5 BBL	0	N
875'	300'	228 Sacks 50/50 Poz		FW/ 2.2 BBL	0	N
<input type="checkbox"/> Check If NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse.						
<input type="checkbox"/> Check If cores were taken and attach core descriptions						

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

**RECEIVED**

AUG 18 2009

COMPLETE BOTH SIDES

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994 as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

- ☐ Part 615 Oil/Gas Well      ☒ Plugging  
☒ Part 625 Mineral Well      ☐ Change of Well Status

Name and address of contractor/service company

Mosaic Potash Hersev  
1395 135<sup>th</sup> Ave  
Hersev, MI 49631

Permit number

397-855-767

Well name and number

Kalium 1032 (Mosaic)

API number

MI-133-3G-A002

Name and address of permittee

Mosaic Potash Hersev  
1395 135<sup>th</sup> Ave  
Hersev MI 49639

Type of well

Solution Mining

Field name

Kalium (Mosaic Potash)

Surface location

NW 1/4 SW 1/4 NW 1/4 Sec 26 T 17N R 9W

Township

Hersev

County

Osceola

Date plugging/change started

5/20/09

Date plugging/change completed

5/28/09

DEQ employee issuing plugging permit or approving Change of Well Status

Ray Vugrinovich

Date issued

3/20/2009

Any change of well status which results in a change of production or a change in injectivity must include production or  
injection test records All records must include a narrative or daily chronology and signed certification noted on reverse.

**WELL PLUGGING**  
(Hole conditions after plugging)

## CASING

Casing size	Where set	Amount casing pulled	Depth casing cut/perfed, or windows milled
13 3/8"	814'	0	
9 5/8 "	5267'	0	
7"	4766'-7958'	4766'	4766'

## PLUGS

Depth of plug Bottom      Top	Make and type of bridge or plug	Cement plugs: type amount of cement & mix water	Additives type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N
300      Surface		108 Sacks of Class A		0	0	Y

☐ Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse.

☐ Check if cores were taken and attach core descriptions

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of  
plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

**RECEIVED**

AUG 18 2009

COMPLETE BOTH SIDES

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

API number  
MI-133-3G-A002

Permit number  
397-855-767

### CHANGE OF WELL STATUS

Change was to: ☐ Convert current zone to: ☐ Remediate well: ☐ Plugback (recomplete as) ☐ Redrill:

☐ Production ☐ Perf and test existing zone ☐ New production zone ☐ Horizontal drain hole

☐ Disposal ☐ Repair casing/cement ☐ Disposal ☐ Collapsed casing

☐ Secondary recovery ☐ Other ☐ Secondary recovery ☐ Underream open hole

☐ Storage ☐ Storage

☐ Other ☐ Other

### Well casing record - BEFORE change

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well casing record - AFTER change (Indicate additions and changes only, complete test record)

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### BEFORE CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

### AFTER CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

### DAILY PRODUCTION TEST RECORD

Date	Oil (bbis)	Water (bbis)	Gas (Mcf)	Pressure	
				Tubing	Casing

### DAILY INJECTION TEST RECORD ☐ Injection well ☐ Brine disposal

Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
		Beginning	Ending	

RECEIVED

### DAILY CHRONOLOGY

Describe in detail the daily chronology of change/plugging, include days shut down. Describe exceptions to issued plugging instructions. Describe tools used, etc. left in hole and any logs run. Include dates pits filled, surface restored etc. Use additional pages as needed.

Date	Narrative	ENVIRONMENTAL QUALITY OFFICE OF GEOLOGICAL SURVEY
5/20/09	Set Big Boy Cast iron bridge plug @ 6100'	
5/21/09	Set 100 Sack Class A plug @ 6080'	
5/22/09	Run free point tool and locate free pipe @ 4770'. Jump collar and retrieve 4766' of 7" casing. Contact Mark Smith (MDEQ). His recommendation was to set 2 <sup>nd</sup> plug 100' into the 7" casing.	
5/27/09	Set 165 sack plug @ 4871'. Lay down pipe and set 180 sack plug @ 4375'. Lay down pipe and set 180 sack plug @ 3875'. Lay down pipe and set 180 sack plug @ 3375'. Lay down pipe and set 180 sack plug @ 2875'. Lay down pipe and set 200 sack plug @ 2375'. Lay down pipe and set 200 sack plug @ 1875'. Lay down pipe and set 200 sack plug @ 1375'. Lay down pipe and set 228 sack plug @ 875'. Lay down pipe and set 108 sack plug @ 300'.	
5/28/09		

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells Act 451 PA 1994, as amended, a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge.

Name and title (printed or typed)  
William Hicks Minefield Supervisor

Authorized signature

*William Hicks*

Date  
6/22/09

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.

API number  
MI-133-3G-A002

Permit number  
397-855-767

### CHANGE OF WELL STATUS

Change was to: ☐ Convert current zone to: ☐ Remediate well: ☐ Plugback (recomplete as) ☐ Redrill:

☐ Production ☐ Perf and test existing zone ☐ New production zone ☐ Horizontal drain hole

☐ Disposal ☐ Repair casing/cement ☐ Disposal ☐ Collapsed casing

☐ Secondary recovery ☐ Other \_\_\_\_\_ ☐ Secondary recovery ☐ Underream open hole

☐ Storage ☐ Storage ☐ Other \_\_\_\_\_

☐ Other \_\_\_\_\_ ☐ Other \_\_\_\_\_

### Well casing record - BEFORE change

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well casing record - AFTER change (Indicate additions and changes only, complete test record)

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### BEFORE CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

### AFTER CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

### DAILY PRODUCTION TEST RECORD

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure	
				Tubing	Casing

### DAILY INJECTION TEST RECORD ☐ Injection well ☐ Brine disposal

Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
		Beginning	Ending	

### DAILY CHRONOLOGY

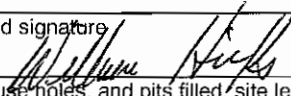
Describe in detail the daily chronology of change/plugging, include days shut down Describe exceptions to issued plugging instructions Describe tools tubing etc left in hole and any logs run Include dates pits filled surface restored etc Use additional pages as needed

Date	Narrative
5/28/09	Cement top at surface Cut and cap 9 5/8"

**RECEIVED**  
AUG 18 2009  
ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION I state that I am authorized by said owner This report was prepared under my supervision and direction The facts stated herein are true accurate and complete to the best of my knowledge

Name and title (printed or typed)	Authorized signature	Date
William Hicks Minefield Supervisor		6/22/09

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.





## MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

## APPLICATION TO:

- ☐ CHANGE WELL STATUS OR  
☒ PLUG AND ABANDON WELL

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment

☐ Part 615 Oil or Gas Well

☒ Part 625 Mineral Well

## Change of well status requested to:

- ☐ Plug back ☐ Perforate ☐ Temporarily abandon  
☐ Convert to ☐ Other P&A

## Last production/injection rate and type of fluid

3/13/2007 200 GPM 1.200 Gravity Brine

## Brief description of project

Set CIBP @ 6100' Set 100 Sack Class A plug. Cut and pull 7" casing. Cement continuous 50/50 poz plugs to 300' Set Class A plug to surface. Cut off wellhead and cap.

## Work to be done by

Mosaic Potash Hersey

## Permit number

397-855-767

## Type of well

Solution Mining

## API number

MI-133-3G-A002

## Name and address of permittee

Mosaic Potash Hersey

1395 135<sup>th</sup> Ave

Hersey, Michigan 49639

## Well name and number

Kalium 1032 (Mosaic Potash)

## Well location

NW 1/4 of SW 1/4 of NW 1/4 Section 26 T 17N R 9W

## Township

Hersey

## County

Osceola

## Date drilling completed

11/15/1994

## Date last produced/utilized

3/13/2007

## Starting date

5/1/2009

## CASING AND CEMENTING RECORD

Hole dia	Casing dia & wt/ft	Depths set	Cement quantity, type, additives	Cement top	Perforations
17 1/2"	13 3/8" 54#	814'	650 Sacks Lite A	Surface	
12 1/4"	9 5/8" 40#	5267'	2475 Sacks Lite A	Surface	
8 1/2"	7 " 23 & 29#	7958'	550 Sacks H	5700'	7850-7880'

Formation record (formation and depth of top, oil, gas and water shows, etc.):

formation

depth

## Detail proposed procedures:

Set CIBP @ 6100'. Set 100 Sack Class A plug @ 6100' Run free point tool and determine free 7" casing Cut and pull 7" casing laying down Set continuous 215 sack plugs of 50/50 poz from 7" cut off depth to 300' Set 115 Sack plug of Class A cement from 300' to surface Cut off wellhead and cap 9 5/8" casing

Name/signature (authorized representative):

Date:

3/20/09

## FOR OFFICE OF GEOLOGICAL SURVEY USE ONLY

## DEQ additional requirements:

NOTICE MARK SMITH (231 876 4434) AND RAY VUGRINOVICH (517 241 1532) NO LESS THAN 72 HOURS BEFORE PLUGGING STARTS. LIQUIDS RECOVERED DURING PLUGGING MAY BE DISPOSED IN THE WOODWARD OR THOMAS DISPOSAL WELLS.

☐ Yes ☐ No ☒ Not applicable Production tests to commence within 10 days of completion and to be filed

☒ Yes ☐ No Service company records are to be filed

Approved by DEQ:

Office:

Approval date:

Termination Date:

Raymond Vugrinovich

LANSING

3/8/2009

3/8/2009

Submit original and three (3) copies of this application to the District Office within 60 days of change of well status  
Note: Three copies of Record of Well Plugging or Change of Well status (EQP 7200-8) and any requested service company records are to be filed within 60 days of completion at the District Office

## APPLICATION TO:

- ☐ CHANGE WELL STATUS OR  
☒ PLUG AND ABANDON WELL

Permit number

397-855-767

API number

MI-133-3G-A002

Well name and number

Kalium 1032 (Mosaic Potash)

Continuation of proposed procedures

**RECEIVED**

MAR 31 2009

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

**REQUEST FOR TRANSFER OF PERMIT**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended Non-submission and/or falsification of this information may result in fines and/or imprisonment

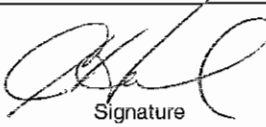
☐ Part 615 Oil/Gas Well☒ Part 625 Mineral Well

Permit number M-397	Well type Brine Prod.	Current true vertical depth 7582
Well name and number Kalium Hersey 1032		
Surface location NW 1/4 SW 1/4 NW 1/4 Section 26 T 17N R 9W		
Township Hersey		County Osceola

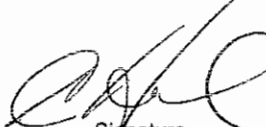
NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13)

**This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.**

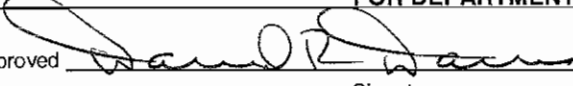
**TRANSFER OF A PERMIT FROM:**

Name(s) of Selling Permittee(s) Kalium Chemicals, Limited		Fed ID # or S S # 38-3545577	
Address: Number and Street, City or Town State ZIP Code Telephone 1395, 135th Avenue Hersey, MI, 49639		231-832-3755	
All permits rights and responsibilities are discharged by:			
Kalium Chemicals, Limited Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**TRANSFER OF A PERMIT TO:**

Name(s) of Acquiring Permittee(s): IMC Potash Hersey Inc.		Fed ID # or S S # ME0132184	
Address: Number and Street City or Town State ZIP Code 1395, 135th Avenue Hersey, MI, 49639		Telephone 231-832-3755	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <u>Royal Bank of Canada</u>			
<input checked="" type="checkbox"/> Blanket <input checked="" type="checkbox"/> On File Bond Number <u>P43087C00008</u> Amount <u>\$25,000</u>			
<input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
IMC Potash Hersey Inc. Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY**

Approved  Signature	MAY 08 2001 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner
---	---------------------	--

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460							
EPA		WELL REWORK RECORD					
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639				
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT - 640 ACRES		STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002			
		SURFACE LOCATION DESCRIPTION NW 1/4 of SW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1274 ft from (N/S) S Line of quarter section and 650 ft. from (E/W) W line of quarter section					
		WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework 7880		TYPE OF PERMIT <input type="checkbox"/> Individual	
		Lease Name Kalium Hersey		Total Depth After Rework 7880		<input checked="" type="checkbox"/> Area	
				Date Rework Commenced 9/19/97		Number of Wells 16	
		Date Rework Completed 10/9/97		Well Number 1032			
WELL CASING RECORD - BEFORE REWORK							
Casing		Cement		Perforations		Acid or Fracture Treatment Record	
Size	Depth	Sacks	Type	From	To		
13-3/8	814	650	Lite				
9-5/8	5267	2475	Class A				
7	7880	530	Class A	7880	7875	4 SH/FT	
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)							
Casing		Cement		Perforations		Acid or Fracture Treatment Record	
Size	Depth	Sacks	Type	From	To		
13-3/8	814	650	Lite				
9-5/8	5267	2475	Class A				
7	7850	530	Class A	7880	7871		
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type			
				Log Types		Logged intervals	
Trip 4 1/2 inch casing out of hole laying.							
Run in fish bottom hole assembly. Could not remove. Rerun							
4 1/2" casing to 7398 ft.							
10/22/97							
CERTIFICATION							
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref CFR 144.32)							
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE 		DATE SIGNED 10/22/97		

MAY 30 1997

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON DC 20460  
**EPA**  
**WELL REWORK RECORD**

NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639		NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639																																																																																																					
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT - 640 ACRES	STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002																																																																																																				
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 150px; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: 0; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: 0; top: 50%; transform: translateY(-50%);">E</div>																																																																																																					SURFACE LOCATION DESCRIPTION NW 1/4 of SW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1274 ft from (N/S) S Line of quarter section and 650 ft. from (E/W) W line of quarter section		
WELL ACTIVITY		Total Depth Before Rework	TYPE OF PERMIT																																																																																																				
Brine Disposal		7880	Individual																																																																																																				
Enhanced Recovery		Total Depth After Rework	X Area																																																																																																				
Hydrocarbon Storage		7880	Number of Wells 16																																																																																																				
X Soft Mining		Date Rework Commenced	Well Number																																																																																																				
Lease Name		4/26/97	1032																																																																																																				
Kalium Hersey		Date Rework Completed																																																																																																					
		4/28/97																																																																																																					

WELL CASING RECORD - BEFORE REWORK						
Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class A	7880	7875	4 SH/FT

WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)						
Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class A	7880	7871	4 SH/FT

Describe rework operations in detail Use additional sheets if necessary	Wire line logs, list each type	
	Log Types	Logged intervals
Trip 4 1/2 inch casing out of hole.	PFC	7878' - 7378'
Run in hole with 5 3/4" mill. Trip		
mill. Run in hole with THL. Land		
at 7892 PFC		

**CERTIFICATION**  
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).

NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor	SIGNATURE 	DATE SIGNED 05/22/97
---	---------------	-------------------------

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, DC 20460

## WELL REWORK RECORD

JUN 2 1997

## NAME AND ADDRESS OF PERMITTEE

IMC Kalium  
1395 135th Avenue  
Hersey, MI 49639

## NAME AND ADDRESS OF CONTRACTOR

IMC Kalium  
1395 135th Avenue  
Hersey, MI 49639LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRES

N									
S									

STATE

MI

COUNTY

Osceola

PERMIT NUMBER

MI-133-3G-A002

## SURFACE LOCATION DESCRIPTION

NW 1/4 of SW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 9W

## LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 1274

Location ft from (N/S) S Line of quarter section

and 650

ft from (E/W) W Line of quarter section

## WELL ACTIVITY

- ☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage  
☒ Sol'n Mining  
 Lease Name

Kalium Hersey

## Total Depth Before Rework

7880

## Total Depth After Rework

7880

## Date Rework Commenced

01/14/97

## Date Rework Completed

01/30/97

## TYPE OF PERMIT

☐ Individual☒ Area

Number of Wells 16

## Well Number

1032

## WELL CASING RECORD — BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class A	7880	7875	4 SH/FT

## WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class H	7880	7871	4 SH/FT

## DESCRIBE REWORK OPERATIONS IN DETAIL

USE ADDITIONAL SHEETS IF NECESSARY

## WIRE LINE LOGS, LIST EACH TYPE

Log Types

Logged Intervals

Trip 4 1/2 inch casing out of hole.  
 Run in hole with 5 3/4" mill. Trip  
 mill. Run in hole with THL. Land  
 at 7884.

## CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please type or print)

Paul McMillen Minefield Supervisor

SIGNATURE

DATE SIGNED

04/15/97

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON DC 20460

## WELL REWORK RECORD

## NAME AND ADDRESS OF PERMITTEE

IMC Kalium  
1395 135th Avenue  
Hersey, MI 49639

## NAME AND ADDRESS OF CONTRACTOR

IMC Kalium  
1395 135th Avenue  
Hersey, MI 49639LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRESSTATE  
MICOUNTY  
OsceolaPERMIT NUMBER  
MI-133-3G-A002

## SURFACE LOCATION DESCRIPTION

NW 1/4 of SW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 9W

## LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 1274 S  
Location ft from (N/S) Line of quarter section  
and 650 ft from (E/W) W Line of quarter section

## WELL ACTIVITY

☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage  
XSol'n Mining  
Lease Name  
Kalium HerseyTotal Depth Before Rework  
7880Total Depth After Rework  
7880Date Rework Commenced  
12-9-96Date Rework Completed  
12-18-96

## TYPE OF PERMIT

☐ Individual  
☐ Area  
Number of Wells 16Well Number  
1032

## WELL CASING RECORD — BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class H	7880	7875	4 SH/FT

## WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class H	7880	7871	4 SH/FT

Trip DESCRIBE REWORK OPERATIONS IN DETAIL  
USE ADDITIONAL SHEETS IF NECESSARY

## WIRE LINE LOGS. LIST EACH TYPE

Trip	Log Types	Logged Intervals
Trip Laying. Perforate from	PFC	7850-6550
7871-7875. Run in hole w/ 4 1/2	Perforate	7871-7875
casing. PFC Injection Point =		
7871'.		

## CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please type or print)

Paul McMillen  
Minefield Supervisor

SIGNATURE

DATE SIGNED

12/20/96




 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
 WASHINGTON, DC 20460

GENCY

AUG 29 1996

**WELL REWORK RECORD**
**NAME AND ADDRESS OF PERMITTEE**

 IMC KALIUM  
 1395 135th Avenue  
 Hersey, MI 49639

**NAME AND ADDRESS OF CONTRACTOR**

 IMC KALIUM  
 1395 135th Avenue  
 Hersey, MI 49639

 LOCATE WELL AND OUTLINE UNIT ON  
 SECTION PLAT — 640 ACRES

 STATE  
 MI

COUNTY

Osceola

PERMIT NUMBER

MI-133-3G-A002

**SURFACE LOCATION DESCRIPTION**

NW 1/4 OF SW 1/4 OF NW 1/4 SECTION 26 TOWNSHIP 17N RANGE 9W

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

 Surface 1274 S  
 Location \_\_\_\_\_ ft. from (N/S) \_\_\_\_\_ Line of quarter section  
 and 650 W  
 \_\_\_\_\_ ft. from (E/W) \_\_\_\_\_ Line of quarter section

**WELL ACTIVITY**
☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage  
 X Sol'n Mining  
 Lease Name  
 Kalium Hersey

Total Depth Before Rework

7880

Total Depth After Rework

7880

Date Rework Commenced

7-15-96

Date Rework Completed

7-17-96

TYPE OF PERMIT

☐ Individual  
☒ Area  
 Number of Wells 16  
 Well Number  
 1032

**WELL CASING RECORD — BEFORE REWORK**

Casing		Comments		Perforations		Annul or Fracture Treatment Record
Size	Depth	Seals	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class B	7880	7877	

**WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)**

Casing		Comments		Perforations		Annul or Fracture Treatment Record
Size	Depth	Seals	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class B	7880	7875	4sh/ft

**DESCRIBE REWORK OPERATIONS IN DETAIL**

USE ADDITIONAL SHEETS IF NECESSARY

**WIRE LINE LOGS, LIST EACH TYPE**

Log Types	Logged Intervals
Trip 2-7/8 tubing and 54-1/2 liner rerun tubing. Injection point= 7874 ft	Perforate 7877-7875

**CERTIFICATION**

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please Print Name) Supervisor

Kyle Barbot, Mineral Resources Supervisor

SIGNATURE

DATE SIGNED

7-20-96


 UNITED STATES ENVIRONMENTAL PROTECTION  
 WASHINGTON, DC 20460

NCT

## WELL REWORK RECORD

## NAME AND ADDRESS OF PERMITTEE

 Kalium Chemicals, Ltd.  
 1395 135th Avenue  
 Hersey, MI 49639

## NAME AND ADDRESS OF CONTRACTOR

 Kalium Chemicals, Ltd.  
 1395 135th Avenue  
 Hersey, MI 49639

 LOCATE WELL AND OUTLINE UNIT ON  
 SECTION FLAT — 340 ACRES

 STATE  
 MI

 COUNTY  
 Osceola

 PERMIT NUMBER  
 MI-133-3G-A002

## SURFACE LOCATION DESCRIPTION

NW 1/4 OF SW 1/4 OF NW 1/4 SECTION 26 TOWNSHIP 17N RANGE 9W

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

 Surface Location 1274 ft. from (N/S) S Line of quarter section  
 and 650 ft. from (E/W) W Line of quarter section

## WELL ACTIVITY

- ☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage

 X Sol'n Mining  
 Lessee Name

Kalium Hersey

## Total Depth Before Rework

7880

## Total Depth After Rework

7880

## Date Rework Commenced

4-3-96

## Date Rework Completed

4-4-96

## TYPE OF PERMIT

☐ Individual

☒ Area  
 Number of Wells 12

 Well Number  
 1032

## WELL CASING RECORD — BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class H			

## WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
13-3/8	814	650	Lite			
9-5/8	5267	2475	Class A			
7	7880	530	Class H	7880	7877	4 SH/FT

 DESCRIBE REWORK OPERATIONS IN DETAIL  
 USE ADDITIONAL SHEETS IF NECESSARY

## WIRE LINE LOGS, LIST EACH TYPE

Log Types	Logged Intervals
Perforate	7880-7877

 Trip 2-7/8 tubing and 4-1/2 liner  
 standing. Perforate 7880 to 7877.  
 Rerun tubing. Injection point=  
 7877 feet.

## CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

 NAME AND OFFICIAL TITLE (Please type or print) SIGNATURE  
 Kyle Barbot, Minerfield Supervisor

DATE SIGNED

4-5-96

# RECORD OF WELL DRILLING OR DEEPENING

USE APPROPRIATE BLOCKS, FOR ITEMS NOT LISTED SUBMIT ATTACHMENTS.

REQUIRED BY AUTHORITY OF:

☐ ACT 61 P.A. 1939, AS AMENDED  
(Submit 2 copies within 30 days  
of completion.)

☒ ACT 315, P.A. 1969, AS AMENDED  
(Submit 2 copies within 60 days  
of completion.)

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN  
FINES AND/OR IMPRISONMENT.

NAME AND ADDRESS OF OWNER  Kalium Chemicals, Ltd. 1395 135th Avenue Hersey, MI 49639			TOWNSHIP Hersey		COUNTY Osceola
NAME AND ADDRESS OF DRILLING CONTRACTOR McLachlan Drilling Company P. O. Box 548 Evart, MI 49631-0548			SUBSURFACE LOCATION (if directionally drilled) SW 1/4 of SE 1/4 of NW 1/4 Section 26 T 17N R 9W		
DATE DRILLING BEGAN 10/17/94	DATE DRILL COMPLETED 11/15/94	DATE WELL COMPLETED Incomplete	FOOTAGES: NORTH/SOUTH 1274 Ft. from S Line and 660 Ft. from W Line of 1/4 Sec.		
TOTAL DEPTH OF WELL Driller 8018 Log 8018	FORMATION AT TD A-1 Salt	PROD FORMATION(S) NA	FOOTAGES: NORTH/SOUTH 60 Ft. from S Line and 989 Ft. from E Line of 1/4 Sec.		
DATE OF FIRST INJECTION	INJECTED FORMATION	SOLUTION FORMATION	FEET DRILLED - CABLE TOOLS From NA To		
			FEET DRILLED - ROTARY TOOLS From Surface 8018		
			ELEVATIONS K.B. 1161.8 R.F. 1159.8 R.T. NA ft. Grd 1148.2 ft.		

## CASING, CASING LINERS AND CEMENTING, OPERATING STRINGS

## PERFORATIONS

SIZE	WHERE SET	CEMENT	FT. PULLED	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
30"	80	Driven	0				YES	NO
13-3/8"	814	650 sks	0					
9-5/8"	5267	2475 sks	0					
7"	7958	530 sks	0			NONE		

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
NA				NA			Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	INTERVAL TREATED	MATERIALS AND AMOUNT USED	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	NONE		NONE				

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION

## DEVIATION SURVEY

## PLUGGED BACK

BRAND	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTION	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	GR-Sonic	8015-5262			2600	0.3			
Birdwell						5650	32			
MI Wireline		Gamma-CCL	7917-7440			7392	6.5			
						7960	2.3			

## PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu ft	B.H.P. AND DEPTH
0	NA	NA	0	0	NA	NA

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
3/28/95	Lawrence E. Bean, Supervisor	Lawrence E. Bean

**FORMATION RECORD**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

ELEVATION USED: 1161.8	GEOLOGIST NAME:	TOPS TAKEN FROM: <input checked="" type="checkbox"/> DRILLERS LOG <input type="checkbox"/> SAMPLE LOG <input type="checkbox"/> ELECTRIC LOG
---------------------------	-----------------	--

FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)	FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)
NOTE: IF WELL DIRECTIONALLY DRILLED, ADD TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE					
0	712	Drift			
712	1493	Michigan Group			
1493	1570	Brown Lime			
1570	1710	Stray Sand			
1710	1842	Marshall			
1842	2580	Coldwater Shale			
2580	3028	Sunbury Shale			
3028	3238	Antrim Shale			
3238	3319	Traverse Formation			
3319	3823	Traverse Lime			
3823	3895	Bell Shale			
3895	4012	Dundee			
4012	4286	Detroit River Anhydrite			
4286	4603	Detroit River Salt			
4603	5132	Massive Anhydrite			
5132	5382	Amheartsburg			
5382	5415	Sylvania			
5415	5631	Bois Blanc			
5631	5977	Bass Island			
5977	6014	Salina G Unit			
6014	6637	F Salt			
6637	6739	E Unit			
6739	6818	D Salt			
6818	6876	C Shale			
6876	7259	B Salt			
7259	7401	A-2 Carbonate			
7401	7751	A-2 Evaporate			
7751	7807	A-1 Carbonate			
7807	8018	A-1 Evaporate			
	TD				
IF WELL WAS CORED, ATTACH CORE DESCRIPTION					
DRILL STEM TEST DATA					
LIST ATTACHMENTS:					
DDC Single Shot Surveys 100-5600 and 5649 - 7960					
GEOLOGICAL SURVEY USE ONLY					
REVIEWED BY:					
DATE OF REVIEW:					



Kalium Chemicals  
well #1032

Kalium Chemicals P.O. Box 290, 11461 South 135th Avenue  
Hersey, Michigan 49639 Telephone: (616) 832-3755 Fax: (616) 832-3349

November 1, 1994

Michigan Department of Natural Resources  
Proration and Technical Evaluation  
735 E. Hazel St.  
Lansing, MI 48912

ATTN: Mr. Thomas Godbold

Dear Sir:

Kalium Chemicals has set and cemented 9 5/8 inch casing in Kalium Hersey #1032. I am faxing the daily drilling report. It may not fax well, so I will repeat the cementing information.

- Ran 140 joints of used 53.5# and 47# 9 5/8 inch casing totaling 5,276 feet
- Shoe at 5,266 feet
- Float Collar at 5,231
- Centralizers at 5,191, 5,152, and 5,117 feet
- DV Tool at 3,052 feet

Cemented first stage with 950 sks. of Halliburton Lite and 250 sks. Class A with 3% CaCl. Displaced with 368 bbl. of pit fluid. Bumped plug at 06:00. After opening the DV tool, circulated 6 bbl. of cement back to surface from the first stage.

Started second stage at 09:00 with 1,125 sks. of Halliburton Lite and 150 sks. Class A with 3% CaCl. Displaced with 216 bbl. of pit fluid. Circulated 130 bbl. of cement back to surface. Bumped plug at 10:45.

We plan to drill out at 04:00 tomorrow morning. Please call me with any questions.

Respectfully submitted,

Larry Bean  
Minefield Supervisor  
Kalium Chemicals

DAY: MON

DATE: 11-7-94

RIG: MOC #4

STATUS: 7 AM to lock up

Report Day No	Drill Rate min/ft	Size	Depth
---------------	-------------------	------	-------

MUD: 525 10.1+ 3.9 NC   1.1  
Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids-%

## HOURLY BREAKDOWN

DEVELOPING  
SURVEYS

## ELEVATIONS

**COORD LAST STATION**

BIT RUNS: Ser#										MUD ADDITIONS									
Run Number	8									Kwik Gel-	Sz								
Size-Make	8 1/2 Rtc									F.W. Gel-	Sz								
Type	HPS3									Salt Gel-	Sz								
Nozzles 1/32"	16	16	16							Starch	Sz								
Depth Out										Paper-	Sz								
Footage	315'									Mudseal-	Sz								
Hours	10									Kwikseal-	Sz								
Condition T/B/Gauge										Soda Ash-	Sz								
Bk Wt.	75									Caustic-	Sz								
RPM	50									Floc.-	gal								
PSI-GPM	1150	380								Bleach-	gal								
FPH	31.5									Lime-	Sz								

MUD		WATER	
Mat'l	Solid Cont.	BRINE	FRESH

**COST**

**This Date**

Total:

C631

### Well Cost

### This Data

**Total**

### Wall Cost

TON

**Pushover**

**FOREMAN**

JOE. Hubbard  
Bill Hicks

DAY: Sun

DATE: 11-6-94

OPERATOR: Kalium Chemical  
WELL NAME: Kalium Hensen 1032

RIG: MAC # 4

6541' 311' STATUS: testing Bops

DAYS: 22 1-3 LAST CSG: 9518 " @ 5267 (T.O.C. = 5118)  
Report Day No Drill Rate min/ft Size Depth

MUD: 519 10.0 29 180000 1.1  
Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids-%

## HOURLY BREAKDOWN

1/2	Dalg	
1/2	See rig	
1	Survey Line Bore FISH out Line Recover Survey tools.	
2 3/4	Dalg	
1	Circ & survey	
3 1/2	Dalg	
1	Circ & survey	
2 3/4	TOOH LTD N.B.P.	
1 1/2	Rig up choke Line	Formation Tops
2	T.H. w/ DCS & Dr to 3000'	④
7 1/2	Test Bore & Fr looks	④

## Formation Tops

2 \_\_\_\_\_  
 3 \_\_\_\_\_  
 4 \_\_\_\_\_  
 5 \_\_\_\_\_  
 6 \_\_\_\_\_  
 7 \_\_\_\_\_  
 8 \_\_\_\_\_  
 9 \_\_\_\_\_  
 10 \_\_\_\_\_

## DEVIATION SURVEYS

\_\_\_\_\_ @ \_\_\_\_\_  
 \_\_\_\_\_ @ \_\_\_\_\_  
 \_\_\_\_\_ @ \_\_\_\_\_

## ELEVATIONS

	M.D.	Drift	Direction	T.V.D	V. Sec	N or S	E or W
GL =	6205'	17 1/2	S 37 E	5923'	1320	991	879
RF =	6361'	19	S 40 E	6071'	1369	1029	909
RT =	6496'	19 3/4	S 33 E	6199'	1413	1065	936
KB =							

BIT RUNS: Sore TC698111 MUD ADDITIONS

MUD		WATER
Mat'l	Solid Cont.	BRAINE FRESH

Run Number	NB 8				Kwik Gel.	N	S
Size-Make	8 1/2 RTG				F.W. Gel.	P	S
Type	HPS3				Salt Gel.	N	S
Nozzles 1/32"	16 16 16				Starch	a	S
Depth Out	6541				Paper-		S
Footage	456'				Mudseat-		S
Hours	10 3/4				Kwikseal-		S
Condition T/B/Gauge	2 2 FN				Soda Ash-		S
Bk Wt.	45000				Caustic-		S
RPM	75-90				Floc-		qs
PSI-GPM	1200 380				Bleach-		qs
FPH	42.4				Lime-		S

**COST**  
**This Date**

Total  
Cost

Well Cost  
This Date

Total  
Well Cost

Tool  
Pusher

Joe H.





Double Check.

1489 U.S. 31 North, Traverse City, Michigan 49684 • (616) 947-1632

Testing Specialists Since 1959

# B.O.P. TEST

Date 11-6-94

Oil Company Kalium chemical

Location Kalium Hersey #1032

Rig No. ~~McLachlan 4~~

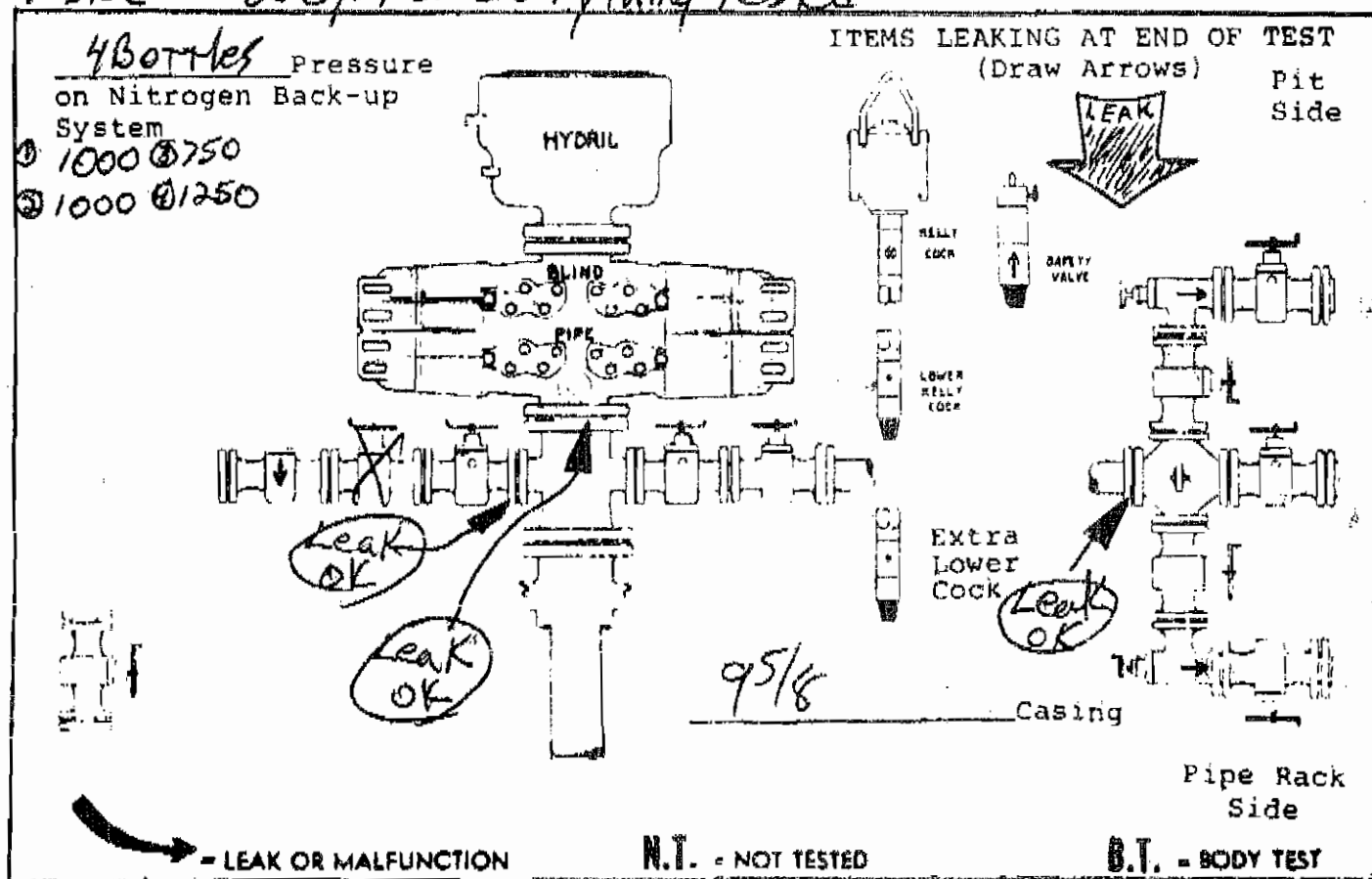
HYDRIL TEST TO.....	<u>1500</u>	POUNDS FOR	<u>20</u>	MINS.
BLIND RAMS TEST TO.....	<u>BT</u>	POUNDS FOR	<u>OK</u>	MINS.
PIPE RAMS TEST TO.....	<u>3000</u>	POUNDS FOR	<u>20</u>	MINS.
KELLY COCK UPPER TEST TO.....	<u>NT</u>	POUNDS FOR	<u>—</u>	MINS.
KELLY COCK LOWER TEST TO.....	<u>NT</u>	POUNDS FOR	<u>—</u>	MINS.
SAFETY VALVE TEST TO.....	<u>NT</u>	POUNDS FOR	<u>—</u>	MINS.
CHOKE LINE TEST TO.....	<u>3000</u>	POUNDS FOR	<u>20</u>	MINS.
CHOKE MANIFOLD TEST TO.....	<u>3000</u>	POUNDS FOR	<u>20</u>	MINS.
CASING TEST TO.....	<u>NT</u>	POUNDS FOR	<u>—</u>	MINS.

Remarks Leak where choke line flanges to choke manifold  
TAKE apart + clean - Replace Bad studs - Change Ring to API OK

② Leak under Bop where flanges to spool - Tighten - Take apart and  
check Ring + Put all Bolts Back in + change Ring - OK

③ Leak where Kill line flanges to Bops - Tighten - Take apart +  
check Ring + clean + Teflon Ring + Retighten - OK

Tested TO 250psi on Everything TESTED



## B.O.P. CLOSING DATA

B.O.P.'s CLOSED using pump and accumulators (indicate which).

Closing Pressure Hydril 1500 Rams 3000 Blinds 3000

Accumulator Bottles Indicated — # at end of Test.

All components of closing system working O.K. at end of test with no delays excepting —

Signed Ken Crawford Tester

## ROKOS CONSULTING INC.

## DAILY DRILLING REPORT

DAY: SAT

DATE: 11-5-94

OPERATOR: Kalium Chemicals

WELL NAME: KALIAM HERSEY 1032

RIG: MDC. #4

6230

409'

STATUS: Dalg

Depth

Footage Cut

DAYS: 19

1-3

LAST CSG:

95%

5267 (T.O.C. = 50RF)

Report Day No.

Drill Rate min/ft

Size

Depth

MUD: 514

9.9

29

174000

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

3 Dalg w/ Deep Assy

1/2 Circ Survey

7 3/4 Dalg w/ Deep Assy

3/4 Circ Survey

3/4 Dalg to 6085

7 1/4 TOON Pick up NBR TIT

4 Dalg w/ Lock up Assy

## Formation Tops

G-unit # @ 5977'

F-SALT @ 6014'

@

@

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL =

RF =

RT =

XB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V Sec

Nor@

E or W

3829

27

S43E

5569

1194

897

795

6016

17

S43E

5743

1264

948

843

BIT RUNS: Ser# (YV338) (JC6981) 1

MUD ADDITIONS

Run Number	7 R	8 NB	Kwik Gel-	Sx
Size-Make	5 1/2 HTZ	5 1/2 RTZ	F.W. Gel-	Sx
Type	J.44	HP53	Salt Gel-	Sx
Nozzles 1/32"	16/16/16	16/16/16	Starch	Sx
Depth Out	6085'	OB	Paper-	Sx
Footage	264'	145'	Mudseal-	Sx
Hours	16 1/4	4	Kwikseal-	Sx
Condition T/B Gauge	JUNK		Soda Ash-	Sx
Br Wt.	50000	45000	Caustic-	Sx
RPM	60	60/75	Ball guns Eloc.	10 gal
PSI-GPM	1150 380	1200 380	Bleach-	gal
FPH	16.2	36.3	Line-	Sx

MUD

Mat'l

Solid

Cont.

WATER

BRINE FRESH

COST

This Date

Total

Cost

Well Cost

This Date

Total

Well Cost

Tool

Pusher

Joe H.

T. H. P.

ROKOS CONSULTING INC.

DAY: Friday

## DAILY DRILLING REPORT

DATE: 11-4-94OPERATOR: KALIUM CHEMICALWELL NAME: KALIUM HERSEY 1032RIG: MDC #45821256STATUS: DRLS

Depth

Footage Cut

DAYS: 183LAST CSG: 958

" @

5267 (T.O.C. = SURF)

Report Day No.

Drill Rate min/ft

Size

Depth

MUD: 5099.829N.C.1420001.1

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

4 1/2 DRLS1 - SERVICE RIG + SUPPLY1/4 DRLS3 1/4 T.O.H. STOP OUT2 1/2 WAIT ON BIT + FIX LIGHTS3 T.I.H.3 - RIG UP + RUN CYRO1/2 T.I.H. 2500. REAM. 30 FT.6 - DRLS

Formation Tops

B. ISLAND @ 5631

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

ELEVATIONS

GL -

RF -

BT -

KB -

COORD LAST STATION

M.D.

Drtt

Direction

T.V.D

V Sec

Nor S

E or W

564932541E541311068.31736BIT RUNS: Ser# (243202) (VV338)

MUD ADDITIONS

Run Number	6	7	RR	Kwik Gel-	Sx
Size-Make	<u>8 1/2 Rtc</u>	<u>8 1/2 Htc</u>		F.W. Gel-	Sx
Type	<u>HP 61</u>	<u>J 44</u>		Salt Gel-	N Sx
Nozzles 1/32"	<u>16 16 16</u>	<u>16 16 16</u>		Starch	Sx
Depth Out	<u>5716</u>	<u>OB</u>		Paper-	N Sx
Footage	<u>436</u>	<u>105</u>		Mudseal-	E Sx
Hours	<u>13 1/2</u>	<u>5 1/2</u>		Kwikseal-	Sx
Condition T/B Gauge	<u>JUNK</u>			Soda Ash-	Sx
Bk Wt.	<u>50</u>	<u>50</u>		Caustic-	Sx
RPM	<u>65</u>	<u>65</u>		Floc-	gal
PSI-GPM	<u>1150 378</u>	<u>1150 378</u>		Bleach-	gal
FPH	<u>32.2</u>	<u>19.</u>		Ume-	Sx

MUD  
Mat'l Solid  
Cont.WATER  
BRINE FRESH

COST

This Date

Total

Cost

Well Cost

This Date

Total

Well Cost

Tool

Pusher

JOE HubbardR. H. W. L. K.



OPERATOR: Kalium Chemical  
WELL NAME: Kalium Hersey 1032  
5280  
RIG: MDC #4  
STATUS: TRIP IN HOLE + V.D.C.

DAYS: 16 LAST CSG: 95/8" @ 5267 (T.O.C. = SURE)  
Report Day No Drill Rate min/ft Size Depth  
MUD: 10.2 28 178 178  
Gradient-psi/ft Wt-ppg Vls-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN  
2 1/2 CIRC.  
2 CEMENT  
3 - W.D. CEMENT  
5 NIPPLE DOWN 130' CUT OFF + WELD ON WEL HEAD  
6 NIPPLE UP 130'  
1/2 TEST B. RAMP 1500 PSI 2000 PSI  
1 1/2 RIG UP KLOCK PICK DRIVE - 2200 PSI TRIP V.D.C.  
3 1/2 CHANGE OUT LIGHT PLANTS

FORMATION TOPS	
	@
	@
	@
	@
	@
	@
	@
	@

DEVIATION SURVEYS  
@ STAGE 2 1125 SA L.T. 4.5 CC  
@ 150 SA 2.5 CC DISPLACEMENT 316 CC  
@ Plug Down to 1000' 1" COIL 1500 130 DAPI 10 SA

M.D.	Drift	Direction	T.V.D	V Sec	N or S	E or W

BIT RUNS: Ser# (LH3206) ( ) ( )		MUD ADDITIONS	
Run Number	6	Kwik Gel-	Sx
Size-Make	8 1/2 etc	F.W. Gel-	Sx
Type	HAP 501	Salt Gel-	Sx
Nozzles 1/32"	16 16 16	Starch	N Sx
Depth Out	9	Paper-	Sx
Footage	1	Mudseal-	Sx
Hours	H	Kwikseal-	Sx
Condition T/B/Gauge		Soda Ash-	Sx
Br Wt.		Caustic-	Sx
RPM		Floc-	gal
PSI-GPM		Bleach-	gal
EPH		Lime-	Sx

MUD	WATER
Mat'l	BRINE
Solid Cont.	FRESH

COST  
This Date  
Total Cost  
Well Cost  
This Date  
Total Well Cost  
Tool Pusher

ED GILMORE  
BILLY HICKS

## DAILY DRILLING REPORT

DATE: 11-1-94OPERATOR: Kalium ChemicalWELL NAME: Kalium HENCO 1032RIG: M.D.C. #4

5280'

63'

STATUS: Cir CSG

Depth

Footage Cut

DAYS: 15

7

LAST CSG: 9578 " @ 5267' (T.O.C. = )

Report Day No

Drill Rate min/ft

Size

Depth

MUD: 525

10.1

29

N/C

Cl-mg/l

LCM-lb/bbl

Solids %

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L. cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

11/4 Day

1/4 Sec

4 Day

11/2 Circ Survey

3 1/2 TOOH

11/2 R.O. &amp; RUN CSG @ Cir

2 R.O. H.A.B. 1 CMT 1st Stage.

## Formation Tops

53.5' ± 47'

AmHind-ly @

Run 14035 9518 40' 52' 55' CSG totaling 5267'

@ 5132'

Clear @ 5266 Foot @ 5231 CMT @ 5191-5152-5117

@

1st CMT w/ 9500 H.A.B. Lte. 1 25000 class 7" w/ 72

@

Dis-1368 BRK R.T. w/ R.O. OPEN N.V. TOOH @ 3052 &amp; CIR

@

@ 8 BBLs CMT to SURFACE 2nd STAGE CMT

@

@ 11253 H.A.B. Lte. 1 15000 class 7" w/ 72

@

@ Clear Dis-1368 BRK R.T. w/ R.O. 130 BRK to SURF.

@

CMT.M.D. in Absorbent @ 10:40 Direction AM T.V.D 11-1-94 V Sec

Nor(S)

GrW

DEVIATION SURVEYS

COORD LAST STATION

GL =

5240

26 1/2

SSIE

SDSZ

916

694

600

RF =

RT =

XB =

ELEVATIONS

BIT RUNS: Ser#

(MAG 2205)

MUD ADDITIONS

Run Number

NB

5

Kwik Gel-

Sx

Size-Make

12 1/2 R.T.C.

F.W. Gel-

Sx

Type

H.P. 35

Salt Gel-

70 Sx

Nozzles 1/32"

25 1/2 L.S.

Starch

Sx

Depth Out

5280

Paper-

2 Sx

Footage

206'

Mudseal-

Sx

Hours

18 1/4

Kwikseal-

Sx

Condition

Run K-

Soda Ash-

Sx

T.P. Gauge

Br. Wt.

55000

Caustic-

Sx

RPM

65

Floc-

gal

PSI-GPM

1850 700

Bleach-

gal

F.L.

113

COST  
This DateTotal  
CostWell Cost  
This DateTotal  
Well CostTool  
PusherMUD  
Marl  
Solid  
Cont.WATER  
BRINE  
FRESH

E.O.G.

ROKOS CONSULTING INC.

DAY: MON

DAILY DRILLING REPORT

DATE: 10-31-94

OPERATOR: Kalium Chemical

WELL NAME: Kalium Hensley 1032

RIG: MDL #4

5217 143  
Depth Footage Cut

STATUS: DRLS

DAYS: 14 5-6 LAST CSG: 1 33/8 @ 814 (T.O.C. = 5.0%)

MUD: .525 10.1 29 NC    
Report Day No Drill Rate ml/rft Size Depth  
Gradient-psu/ft Wt-ppg Vls-sec W.L-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

3/4 DRLS  
1/4 SER Rig  
1/2 DRLS  
2 1/2 TOOTH LAYDOWN 1 Bad 8" DL.  
4 - STRAP IN HOLE Change to LOCKED RSS.  
9 - DRLS  
1 Fix mud line  
5 1/2 DRLS  
1/2 Fix

Formation Tops

AM Hensley @ 5132  
@  
@  
@  
@  
@  
@  
@

DEVIATION SURVEYS

@  
@  
@

M.D. Drift Direction T.V.D V Sec Nor S E or W

ELEVATIONS

GL =  
RF =  
RT =  
KB =

COORD LAST STATION


BIT RUNS: Ser# (C@5730) (MA6885) (

MUD ADDITIONS

Run Number	4	5	RR		Kwik Gel-	Sx
Size-Make	12 1/4 RTL	12 1/4 RTL			F.W. Gel-	Sx
Type	HP62A	HP63			Salt Gel-	Sx
Nozzles 1/32"	28 28 28	28 28 28			Starch	Sx
Depth Out	5076	00			Paper-	Sx
Footage	1668	143			Mudseal-	Sx
Hours	105	13			Kwikseal-	Sx
Condition T/B/Gauge	5 4 1/4				Soda Ash-	Sx
Bit Wt.	55	55			Caustic-	Sx
RPM	65	65			Floc-	gal
PSI-GPM	1850 700	1850 700			Bleach-H2O	gal
FPH	15.8	11.0			Lime-	Sx

MUD  
Mat'l Solid Cont.  
WATER  
BRINE FRESH

Cl  
Ti  
Te  
Cl  
W  
Ti  
Ti  
W

Tool Pusher JOE HUBBARD  
FOREMAN Billy Hicks



ROKOS CONSULTING INC.

DAY: SKN

DAILY DRILLING REPORT

DATE: 10-30-94

OPERATOR: Kallium Chemicals

WELL NAME: Kallium H-20-94 1032

RIG: MDC #4

5074 217'

STATUS: Drig Lock-up

DAYS: 13 7

LAST CSG: 13 3/8 @ 814 (T.O.C. = SURF)

Report Day No. 13 Drill Rate min/ft 7

MUD: 1519 10.0 29 W/C 120000 1.1

Gradient-psi/ft 10.0 Wt-ppg 29 W.L. Sec W/C Cl-mg/l 120000 LCM-lb/bbl 1.1 Solids % 1.1

HOURLY BREAKDOWN	<u>1/2</u> <u>circ &amp; survey</u>	
	<u>21</u> <u>Drig</u>	
	<u>1/2</u> <u>circ &amp; survey</u>	
	<u>2</u> <u>Drig</u>	
DEVIATION SURVEYS	@	
	@	
	@	
	@	
	@	
	@	
	@	
	@	
	@	
	@	

ELEVATIONS	COORD LAST STATION	M.D.	Drift	Direction	T.V.D	V. Sec	N or S	E or W
		<u>4983</u>	<u>263/4</u>	<u>543E</u>	<u>4822</u>	<u>802</u>	<u>616</u>	<u>516</u>
GL =								
RP =								
AT =								
KB =								

BIT RUNS: Ser#				MUD ADDITIONS			
Run Number	<u>4</u>			Kwik Gel-	<u>Sx</u>		
Size-Make	<u>12 1/4" RLC</u>			F.W. Gel-	<u>Sx</u>		
Type	<u>HP62 A</u>			Salt Gel-	<u>40</u>	<u>Sx</u>	
Nozzles 1/32"	<u>28 28 28</u>			Starch	<u>Sx</u>		
Depth Out	<u>03</u>			Paper-	<u>1</u>	<u>Sx</u>	
Footage	<u>1669'</u>			Mudseal-	<u>Sx</u>		
Hours	<u>103</u>			Kwikseal-	<u>Sx</u>		
Condition				Soda Ash-	<u>Sx</u>		
T/B/Gauge				Caustic-	<u>Sx</u>		
Bk Wt.	<u>50000</u>			Floc-	<u>gal</u>		
RPM	<u>65</u>			Bleach-	<u>gal</u>		
PSI-GPM	<u>1800 700</u>			Lime-	<u>Sx</u>		
FBH	<u>16.2</u>						

MUD		WATER	
Mat'l	Solid Cont.	BRINE	FRESH
		Tool Pusher	
		<u>JDE H</u>	
FOREMAN		<u>JACK ROKOS</u>	

ROKOS CONSULTING INC.

DAY: SAT

DAILY DRILLING REPORT

DATE: 10-29-94

OPERATOR: KALIAM CHEMICAL

WELL NAME: KALIAM HERSEY 1032

RIG: MDC #4

48.57 283

STATUS: 1 RUN SURVEY

DAYS: 12 5-7

LAST CSG: 13 3/8 " @ 814 (T.O.C. = SURF)

MUD: 514 9.9 29

NC 130000 1.1

Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

1 1/2 DRLS  
 1 - SER RIS & REPAIR DRILL START  
 5 1/2 DRLS  
 1 1/4 SURF 4668 2 - 538E  
 15 3/4 DRLS

DEVIATION SURVEYS

Formation Tops

@

@

@

@

@

@

@

@

@

ELEVATIONS

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V Sec

Nor S

E or W

GL =

4608

24°

S38E

4484

642

495

410

RF =

4797

25 1/2

S42E

4655

721

555

461

RT =

KB =

BIT RUNS: Ser#

(605730) ( ) ( )

MUD ADDITIONS

Run Number	4								Kwik Gel-	Sx
Size-Make	12 1/4 70tr								F.W. Gel-	Sx
Type	HP 62.2								Salt Gel-	Sx
Nozzles 1/32"	28 28 28								Starch	Sx
Depth Out	OB								Paper-	Sx
Footage	1452								Mudseal-	Sx
Hours	8.0								Kwikseal-	Sx
Condition T/B/Gauge									Soda Ash-	Sx
Bit Wt.	50								Caustic-	Sx
RPM	65								Moist 40 ga	
PSI-GPM	1800 700								Bleach-	Sx
FPH	18.1								Lime-	Sx

MUD  
Mat'l Solid Cont

WATER  
BRINE FRESH

Pusher

Joe Hubbard

FOREMAN

Billy Hicks

ROKOS CONSULTING INC.

DAY: FRI

DAILY DRILLING REPORT

DATE: 10/28/94

OPERATOR: Kallium Chemical

WELL NAME: Kallium HERSEY 1032

RIG: MDC #4

4574 375

STATUS: DRLG D.R. SHT

Depth Footage Cut

DAYS: 11 3-4

LAST CSG: 1338 @ 814 (T.O.C. = 548F)

MUD: 499 9.6 28 NE

Report Day No. Drill Rate min/h Size Depth  
Gradient-psi/ft Wt-ppg Vis-sec W.L.-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN

2 - DRLG  
1/2 - SER. RIS  
4 - DRLG  
1/2 - CIRC + SURVEY  
9 - DRLG  
1/4 - SURVEY  
4 1/2 - DRLG  
2 - FIX 4 JOINT  
1 1/4 - DRLG

Formation Tops

DET RIVER @ 4212  
DET. RIVER SHT 4286  
@  
@  
@  
@  
@  
@

DEVIATION SURVEYS

@  
@  
@

ELEVATIONS

	M.D.	Drift	Direction	T.V.D	V. Sec	N or S	E or W
GL =	4234	22 1/4	S 39 E	4140	496	381	318
1 1/2 =	4421	23	S 39 E	4312	567	437	364
BT =							
KB =							

COORD LAST STATION

BIT RUNS: Ser# (C05730) ( ) ( ) MUD ADDITIONS

Run Number	<u>4</u>							Kwik Gel-	Sx
Size-Make	<u>12 1/4 Rte</u>							F.W. Gel-	Sx
Type	<u>HP62A</u>							Salt Gel-	<u>25</u> Sx
Nozzles 1/32"	<u>28 28 28</u>							Starch	Sx
Depth Out	<u>0.8</u>							Paper-	Sx
Footage	<u>1169</u>							Mudseal-	Sx
Hours	<u>59</u>							Kwikseal-	Sx
Condition T/B/Gauge								Soda Ash-	Sx
Bit Wt.	<u>55</u>							Caustic-	Sx
RPM	<u>60</u>							Floc-	ga
PSI-GPM	<u>1700 700</u>							Bleach-	ga
PPH	<u>19.8</u>							Lime-	<u>3</u> Sx

	MUD		WATER	
	Mat'l	Solid Cont.	BRINE	FRESH
COST This Date	<u>200</u>	<u>1400</u>	<u>0</u>	<u>0</u>
Total Cost	<u>9185</u>	<u>15400</u>	<u>0</u>	<u>0</u>

Well Cost This Date 8220  
Total Well Cost 198,900  
Tool Pusher Ed Gilmore  
FOREMAN Billy Hicks

	MUD		WATER	
	Mat'l	Solid Cont.	BRINE	FRESH
COST				
This Date	300	1400	0	0
Total				
Cost	8985	14000	0	0
Well Cost				
This Date	8620			
Total				
Well Cost	190,680			
Tool				
Pusher	Ed G. Moore			
FOREMAN	Billy Hicks			





## ROKOS CONSULTING INC.

DAY: MON

## DAILY DRILLING REPORT

DATE: 10-24-94OPERATOR: Kalium ChemicalWELL NAME: Kalium Henry 1032RIG: MOC #43405290STATUS: TOO H LAY DOWN MOTOR

Depth

Footage Cut

DAYS: 72-3LAST CSG: 1 3/8

Size

Depth

(T.O.C. = SURF)

Report Day No

Drill Rate min/ft

MUD: 14739.129NE69000

LCM-lb/bbl

1.5

Gradient-psi/ft

Wt-ppg

Vis-sec

W L-cc

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

1/2 DRLS w/ motor4 1/2 MIX ROAD & CLEAN HOLES3 3/4 DRLS1 1/4 CIR & PUMP SAVED MIX IN RD9 DRLS1 1/2 CIR & MIX SURF3 1/2 TOO H

DEVIATION SURVEYS

@

@

@

## Formation Tops

TRAV FM @ 3238TRAV LM @ 3319

@

@

@

@

@

@

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Drift

Direction

T.V.D

V. Sec

Nor S

E or W

323219.2S 41 E32191016779335723.1S 37 E3335146102107

BIT RUNS: Ser# (CD4693) ( ) ( )

MUD ADDITIONS

Run Number	<u>3</u>	Kwik Gel-	Sx
Size-Make	<u>1 1/4 Rtc</u>	F.W. Gel-	Sx
Type	<u>HP53</u>	Salt Gel-	<u>170</u> Sx
Nozzles 1/32"	<u>28 28 28</u>	Starch	Sx
Depth Out	<u>3405</u>	Paper-	<u>2</u> Sx
Footage	<u>804</u>	Mudseal-	Sx
Hours	<u>3 1/2</u>	Kwikseal-	Sx
Condition	<u>3 3 1/8</u>	Soda Ash-	Sx
Tri/Gauge		Caustic-	Sx
Bk Wt.	<u>25</u>	Floc-	ca
RPM	<u>150</u>	Bleach-	ca
PSI-GPM	<u>1700 700</u>	Lime-	Sx
FBH	<u>25.5</u>		

MUD	Mat'l	Solid Cont.	WATER	
			BRINE	FRESH
COST				
This Date	<u>1805</u>	<u>1400</u>	<u>0</u>	<u>0</u>
Total				
Cost	<u>8125</u>	<u>9800</u>	<u>0</u>	<u>0</u>

Well Cost  
This Date27507Total  
Well Cost159810Tool  
PusherEd Gillmore

FOREMAN

Billy Hicks



OPERATOR: KALIAM Chemical  
 WELL NAME: KALIAM Hersey 1032  
 RIG: MOC #4  
 STATUS: Drilling w/ Dyna Drill  
 Depth 3115' Footage Cut 496'  
 DAYS: 6 2 LAST CSG: 1338 " @ 814 (T.O.C. = Surface)  
 Report Day No 6 Drill Rate min/ft 29 Size 69000 Depth 814  
 MUD: 1462 8.9 29 WL-cc Cl-mg/l LCM-lb/bbl Solids %  
 Gradient-psi/ft Wt-ppg Vis-sec

7 1/2 Dyna Drilling  
 2 1/2 P.O.H w/ D.P. to S.O.C. 1200 sub Pull STEERING tool  
 Repair & R.I.H w/ same  
 1 Wash Back To Bottom so Fill  
 13 Acc Dyna Drilling

HOURLY BREAKDOWN

FORMATION TOPS

ANTRIM @ 3028

@

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

	M.D.	Drift	Direction	T.V.D	V Sec	Gr S	Ebr W
GL =	2700	4.9	S26E	2700	-9	21	13
RF =	2793	8	S31E	2792	2	16	18
RT =	2888	10.4	S37E	2886	17	1	27
KB =	2981	12	S34E	2977	35	16	37
	3106	15.1	S40E	3099	64	34	55

BIT RUNS: Ser# (C04693) ( ) ( )		MUD ADDITIONS	
Run Number	3	Kwik Gel-	Sx
Size-Make	12 1/4 RTC	F.W. Gel-	Sx
Type	HP53	Salt Gel-	60 Sx
Nozzles 1/32"	28 28 28	Starch	Sx
Depth Out	03	Paper-	Sx
Footage	514	Mudseal-	Sx
Hours	22 1/2	Kwikseal-	Sx
Condition		Soda Ash-	Sx
T/B/Gauge		Caustic-	Sx
Bit Wt.	35,000	Floc-	gal
RPM	150 DR	Bleach-	gal
PSI-GPM	1500 700	Lime-	Sx
FPH	22.8		

COST

This Date

Total Cost

Well Cost

This Date

Total Well Cost

Tool Pusher

ED Gilmore

Jack Rokos

FOREMAN

OPERATOR: KALIAM Chemical  
 WELL NAME: KALIAM HERSEY 1032  
 RIG: MDC. #4  
 STATUS: DRILLING 2/10/94  
 DAYS: 5 2-2/94 LAST CSG: 13 7/8" @ 814 (T.O.C. = SKI)  
 MUD: 462 5.9 29 NC  
 Gradient-psi/ft Wt-ppg Vis-sec W L-cc Cl-mg/l LCM-lb/bbl Solids %

HOURLY BREAKDOWN	1/2	SKI RIG
	3 1/2	RIS RIG RIG DRILLING 2/10/94
	5 1/2	DRILLING
	1/4	TRIN 10 4725
	1 1/4	MIX MUD
	1 1/2	T.H. 14 57/8 1 CIRC
	2	1 14 57/8 1 CIRC TYRO
	2 1/4	T.O.H.
	1 1/2	PICK DYNAMITE 1 11-11-5
	2	T.H.
DEVIATION SURVEYS	@	
	@	
	@	
	@	

	M.D.	Drift	Direction	T.V.D.	V. Sec	N or S	E or W
GL =							
RF =							
RT =							
KB =							

BIT RUNS: Ser# (AM2191) (CD4693)										MUD ADDITIONS	
Run Number	KB	2	3	4						Kwik Gel-	Sx
Size-Make		12	12	12						F.W. Gel-	Sx
Type		5 1/2	4 1/2							Salt Gel-	70 Sx
Nozzles 1/32"		1 1/2	2 1/2							Starch	Sx
Depth Out		2601	20	CB						Paper-	Sx
Footage		1751	18							Mudseal-	Sx
Hours		37 1/2	2							Kwikseal-	Sx
Condition		8	3	1/2						Soda Ash-	Sx
T/B/Gauge										Caustic-	Sx
Bit Wt.		50	25							Floc-	4 gal
RPM		7	15							Bleach-	gal
PSI-GPM		13	70	1300	500					Lime-	Sx
FPH		47.5	9								

COST  
This Date  
  
Total  
Cost  
  
Well Cost  
This Date  
  
Total  
Well Cost  
  
Tool  
Pusher

Ed  
P.

Billings

OPERATOR: KALIAM Chemical

WELL NAME: KALIAM HERSEY 1032

RIG: MDC #4

STATUS: DRG

Depth: 2426 Footage Cut: 623

DAYS: 4 LAST CSG: 13 3/8 @ 814 (T.O.C. = 5.0%)

Report Day No: 4 Drill Rate min/ft: 2-2 1/2 Size: 13 3/8 Depth: 814

MUD: 46.8 7 28 NC 18000 2.5

Gradient-psi/ft: 7 Wt-ppg: 28 Vls-sec: NC W.L.-cc: 18000 Cl-mg/l: 2.5 LCM-lb/bbl: 2.5 Solids %: 2.5

HOURLY BREAKDOWN

3 DRG  
1 SER. RIG + CHANGE TO 1 IN DRILL SHFT  
8 1/2 DRG  
1 1/4 SER. RIG  
5 3/4 DRG  
1 1/4 SER. RIG  
5 1/4 DRG

Add 100 Ppt & Run

Formation Tops	
<u>Coldwater</u>	<u>1842</u>
@	
@	
@	
@	
@	
@	
@	

DEVIATION SURVEYS

@	
@	
@	

ELEVATIONS	COORD LAST STATION						
		M.D.	Drift	Direction	T.V.D	V. Sec	N or S
GL =							
RF =							
RT =							
KB =							

BIT RUNS: Ser#		MUD ADDITIONS	
Run Number	<u>2</u>	Kwik Gel-	Sx
Size-Make	<u>12 1/4 WDC</u>	F.W. Gel-	Sx
Type	<u>4 F.S.L.</u>	Salt Gel-	<u>32</u> Sx
Nozzles 1/32"	<u>20/30</u>	Starch	Sx
Depth Out	<u>DB</u>	Paper-	<u>1</u> Sx
Footage	<u>1600</u>	Mudseal-	Sx
Hours	<u>32</u>	Kwikseal-	Sx
Condition		Soda Ash-	Sx
T/B Gauge		Caustic-	Sx
Bit Wt.	<u>40</u>	Floc-	gal
RPM	<u>90</u>	Bleach-	gal
PSI-GPM	<u>1150 700</u>	Lime-	Sx
FPH	<u>50.1</u>		

COST  
This Date 1

Total  
Cost

Well Cost  
This Date

Total  
Well Cost

Tool  
Pusher Ed 31 MDC

FOREMAN Billy Hicks

## DAILY DRILLING REPORT

DATE: 10-19-94

OPERATOR: Kalium ChemicalWELL NAME: Kalium HERSEY 1032RIG: M.D.C. #4

820

208

STATUS: Rig Repair Rotary table

Depth

Footage Cut

DAYS: 2

2-3

LAST CSG: 13 3/8

Size

8 1/4

T.O.C. = Surf

Report Day No

Drill Rate min/ft

MUD: 431

R2

39

Gradient-psi/ft

Wt-ppg

Vis-sec

W.L.-ss

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

5 1/2 Dn/c

4 1/2 circ H/L clean

1 T.O.H. to RUN CSS

3 1/4 RW RUN CSS &amp; ENT w/ H/L B

4 W.O. C.M.

4 3/4 cut off CSS &amp; weld on Head

4 W.O. B.O.C.

1 Rig Repair change out Rotary table

Formation Tops

@

@

@

@

@

@

@

@

DEVIATION SURVEYS

@

@

@

BASE OF DRIFT 712'

ELEVATIONS

GL =

RF =

RT =

KB =

COORD LAST STATION

M.D.

Dist

Direction

T.V.D

V. Sec

Nor S

E or W

RAN 90FTS 13 3/8 54.5 555 STAL TOTALING 814.18 CEMENT

Back @ 90FT CEMENT w/ HOMOCO 5005x LITE 3%

CLARE &amp; 1505x w/ 3% CLCO. D.C. w/ 122 BAL F.W.H

WTH CIL 40 BAL CMT TO SURFACE. CMT IN

Place @ 4:45 PM 10-19-94

BIT RUNS: Ser#

(LE 722) ( ) ( )

MUD ADDITIONS

Run Number

NB RR

1 RT

Kwik Gel-

Sx

Size-Make

17 1/2 Htc

F.W. Gel-

70 Sx

Type

R 11

Salt Gel-

146 Sx

Nozzles 1/32"

18 18 20

Starch

Sx

Depth Out

820

Paper-

Sx

Footage

820

Mudseal-

Sx

Hours

15

Kwikseal-

Sx

Condition

4 4 72

Soda Ash-

3 Sx

T/B/Gauge

4 4 72

Caustic-

3 Sx

Bit Wt.

2500

Floc-

gal

RPM

90

Bleach-

2 gal

PSI-GPM

200 300

Lime-

1 Sx

FPM

54.7

Lime-

1 Sx

MUD  
Mat'l Solid  
Cont.WATER  
BRINE FRESH

COST

This Date

Total

Cost

Well Cost

This Date

Total

Well Cost

Tool

Pusher

ROPERMAN

ED GILLMORE

JACK ROKOS



## DAILY DRILLING REPORT

DATE: 10-18-94

OPERATOR: Kalium ChemicalWELL NAME: KALIAM HERSEY 1032RIG: M-DC. #4612612STATUS: DRLG

Depth

Footage Cut

DAYS: 1

Report Day No

Drill Rate min/ft

LAST CSG: 30

Size

60

Depth

T.O.C. = DRIVENMUD: 462

Gradient-psi/ft

2.9

Wt-ppg

36

Vis-sec

NC

W.L.-cc

F.W

Cl-mg/l

LCM-lb/bbl

Solids %

HOURLY BREAKDOWN

9 1/2 RIG UP + MIX MUD1 1/2 DRLG RET HOLE + MUD HOLE1 Pick up BH QC. MAKE UP BIT DRLG 64.5'2 ON PLUG DC + BIT7 DRLG1 CIRC + SAND MUD2 DRLG

Formation Tops

@

@

@

@

SPUD 17 1/2 HOLE @ 530 PM10-17-94

@

@

@

DEVIATION SURVEYS

@

@

@

M.D.

Grnt

Direction

T.V.D

V. Sec

N or S

E or W

GL =

RF =

RT =

KB =

COORD LAST STATION

BIT RUNS: Ser#

(LE 722)

MUD ADDITIONS

Run Number	NB	RR	1 RT	Kwik Gel-	Sx
Size-Make			<u>17 1/2 H+G</u>	F.W. Gel-	Sx
Type			<u>R11</u>	Salt Gel-	Sx
Nozzles 1/32"			<u>18 18 20</u>	Starch	Sx
Depth Out			<u>DB</u>	Paper-	Sx
Footage			<u>612</u>	Mudseal-	Sx
Hours			<u>9 1/2</u>	Kwikseal-	Sx
Condition				Soda Ash-	Sx
T/B Gauge				Caustic-	Sx
Bit Wt.			<u>25</u>	Floc-	gal
RPM			<u>90</u>	Bleach-	gal
PSI-GPM			<u>300 370</u>	Lime-	Sx
PPH			<u>64.4</u>		

COST  
This DateTotal  
CostWell Cost  
This DateTotal  
Well CostTool  
Pusher

FOREMAN

MUD  
Mat'l Solid  
Cont.WATER  
BRINE FRESHEd GillmoreBill Hicks



# LETTER OF TRANSMITTAL

TO Geological Survey Division  
Michigan Dept. of Natural Resources  
Proration Unit  
P.O. Box 30256  
Lansing, MI 48909

DATE <b>10/31/94</b>	JOB NO. <b>94375</b>
ATTENTION <b>Supervisor of Wells</b>	
RE: <b>Well Elevations - Kalium Chemicals</b>	
<b>Kalium Hersey #1032</b>	
<b>Permit #M-395</b>	
<b>Section 26, T17N, R9W</b>	
<b>Hersey Township, Osceola County</b>	
<b>Michigan</b>	

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via \_\_\_\_\_ the following items:

- ☐ Shop drawings    ☐ Prints    ☐ Plans    ☐ Samples    ☐ Specifications  
☐ Copy of letter    ☐ Change order    ☐ \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION

THESE ARE TRANSMITTED as checked below:

- ☐ For approval    ☐ Approved as submitted    ☐ Resubmit \_\_\_\_\_ copies for approval  
☒ For your use    ☐ Approved as noted    ☐ Submit \_\_\_\_\_ copies for distribution  
☐ As requested    ☐ Returned for corrections    ☐ Return \_\_\_\_\_ corrected prints  
☐ For review and comment    ☐ \_\_\_\_\_  
☐ FOR BIDS DUE \_\_\_\_\_ 19 \_\_\_\_\_ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS \_\_\_\_\_

Elevations for subject well are as follows:

Ground = 1148.2'    Rig Floor = 1159.8'    Top KDB = 1161.8'

Above elevations are U.S.G.S. datum.

COPY TO Larry Bean - Kalium Chemical



SIGNED: \_\_\_\_\_

*[Signature]*

STATE OF MICHIGAN



JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

Stevens T. Mason Building, P.O. Box 30256 Lansing, MI 48909

ROLAND HARMES, Director

GEOLOGICAL SURVEY DIVISION

P O Box 30256 Lansing, MI 48909-7756

October 21, 1994

NATURAL RESOURCES  
COMMISSION

JERRY C. BARTNIK  
LARRY DEVUYST  
PAUL EISELE  
JAMES HILL  
DAVID HOLLI  
JOEY M SPANO  
JORDAN B TATTER

Mr. Lawrence E. Bean  
Kalium Chemicals Ltd.  
1395 135th Avenue  
Hersey, MI 49639

Dear Mr. Bean:

Re: Kalium Hersey #1032, Osceola County

We have discovered a bookkeeping error which resulted in this permit being assigned the wrong sequential permit number. The number indicated on the permit M395 is incorrect. The correct permit number should be M397. Please make this change to your copies and file, and use it on any records filed or future correspondence.

I sincerely apologize for this error and any inconvenience it may cause.

Sincerely,

A handwritten signature in cursive script that reads "William R. Lee".

William R. Lee  
Permit Coordinator  
Permits and Bonding Unit  
Geological Survey Division  
(517) 334-6974

cc: Hal Fitch, DNR  
File





6684

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING MICHIGAN 48909

**PERMIT TO**

☒ DRILL ☐ DEEPEN ☐ REWORK ☐ OPERATE

GRANTED UNDER PROVISIONS OF

Act 61 P.A. 1939, as amended ☒ Act 315, P.A. 1969 as amended  
(M.C.L. 319.1 to 319.27) (M.C.L. 319.211 to 319.236)

Violation of and/or non-compliance with the provisions  
of the acts and conditions of permit may result in penalties.  
This permit includes as requirements all the operations and methods  
proposed by the applicant, unless rejected or altered by the DNR, and  
along with the attached stipulations are incorporated in its entirety by  
reference.

WELL NAME **KALTIM HERSEY #1032** WELL NO

PERMIT <b>M 397</b> <b>N-395</b>	ISSUED <b>9/8/94</b>	TYPE OF WELL <b>SOLUTION MINING</b>
CANCEL AND TRANSFER	ISSUED	FORMATION <b>A-1 EVAPORATE</b>
DEEPENING PERMIT		DEPTH <b>7800' MD 8075' TVD</b>
PERMIT EXPIRES <b>3/8/95</b>		KIND OF TOOLS <b>ROTARY</b>
ISSUED TO <b>KALTIM CHEMICALS, LTD.</b> <b>1395 135th AVENUE</b> <b>HERSEY, MI 49639</b>		

## LOCATION AND FOOTAGES:

**SBL:** NW 1/4 SW 1/4, NW 1/4, Sec. 26, T17N, R9W, Hersey Township, Osceola County.  
**1274 feet from South and 650 feet from West Line of quarter section.**

**EHL:** SW 1/4, SW 1/4, NW 1/4, Sec. 26, T17N, R9W, Hersey Township, Osceola County.  
**50 feet from South and 909 feet from East Line of quarter section.**

## CASING AND SEALING REQUIREMENTS

O.D. SIZE	WT./FT.	CASING GRADE	CONDITION	DEPTH	SACKS	CEMENT	W.O.C. (HRS.)
13 3/8"	54.5#	J-55	NEW	@ 800'	625		18
9 5/8"	40#	K-55	NEW/USED	5250'	1800		16
7"	23#	L-80	NEW	8000'	300		16

1. @ Surface casing shall be set at least 100' into competent bedrock and below the deepest freshwater aquifer with cement circulated to surface.
2. No earthen reserve pit is to be dug. Steel tanks are to be used to contain drilling fluids and cuttings.
3. Solids and cuttings may be temporarily stored in the asphalt lined impoundment area. All cuttings shall be removed within 30 days after reaching total depth and hauled to a disposal site approved by Cadillac District Office, Hal Fitch, (616) 775-9727.
4. 7" production casing shall be cemented such that an adequate sheath is provided through and above the A2 Carbonate. The annulus between the 7" and 9 5/8" casing strings shall be continuously monitored and recorded.
5. Contact Thomas Godbold at the Lansing Office, (517) 334-6945, 24 hours prior to commencing drilling operations.
6. This well shall be drilled and operated in compliance with the Hydrogen Sulfide Rules (R 299.1911 to R 299.1999). NOTIFY LOCAL EMERGENCY PREPAREDNESS COORDINATOR OF WELL LOCATION, H2S POTENTIAL, and CONTINGENCY PLAN AVAILABILITY prior to moving in rig.
7. Due to proximity of existing wells, protection shall be provided for any wellhead located within the drilling area to prevent any damage during drilling and completion activities.

OFFICE TO BE NOTIFIED BEFORE DRILLING/DEEPENING STARTS

**CADILLAC DISTRICT OFFICE**  
**(616) 775-9727**

BY

**WILLIAM R. LEE**

PERMIT COORDINATOR

PAGE 1 of PAGE(S)

**(517) 334-6974**  
FOR THE SUPERVISOR OF WELLS/MINERAL WELLS

### THIS PERMIT IS SUBJECT TO THESE GENERAL CONDITIONS

1. Drilling operations shall not start until the drill site preparation requirements are completed.
2. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all the terms and conditions of this permit and the rules, orders and requirements of the Supervisor of Wells/Mineral Wells.
3. The permittee is required to give notice to public utilities in accordance with Act 53, PA 1974 (M.C.L. 460.701 to 460.718).
4. Any changes from what is stated in the permit application and permit shall be approved by the Supervisor of Wells/Mineral Wells.
5. This permit is valid only for the permittee of issue and any change of ownership shall be accompanied by a request to the Supervisor of Wells/Mineral Wells to transfer the permit from the current owner to the new owner.
6. "NOTICE AND REQUIREMENTS FOR SOURCES OF WATER AND WATER WELLS USED IN CONJUNCTION WITH OIL AND GAS OR MINERAL WELL DRILLING AND OPERATIONS" December 1, 1984 is made part of and a condition of this permit.
7. During well completion and testing procedures all fluids shall be contained in tanks and transported to off site disposal facilities.
8. The Michigan Air Pollution Control Commission rules require that a person shall not install nor alter sour gas or oil well production equipment and flare unless a permit to install has been approved by the Commission. An operator is allowed to drill and test a sour well prior to obtaining the necessary permit to install from the Commission, but is not allowed full production of such wells before issuance of the necessary air use permits.
9. This permit does not convey property rights in either real estate or material or does it authorize any injury to private property or invasion of private or public rights or does it waive the necessity of seeking federal and local permits or complying with other state statutes.
10. If a Hydrogen Sulphide contingency plan is required, a copy of PART II of the plan shall be posted in the primary briefing area.
11. All trash and garbage shall be removed from the drill site at the completion of drilling.
12. Blowout preventers, accumulators, and pumps shall be certified as operable under the product manufacturer's minimum operational specifications. This certification shall include proper operation of the closing unit, valving, pressure gauges, and manufacturer's recommended accumulatory fluids. Certification may be obtained through those companies presently used to test the blowout preventers stack and casing. Certification shall be required annually and shall be posted on the rig floor.
13. In addition to the primary closing system, including an accumulator system, the blowout preventers shall have a secondary system. A combination of any two of the following secondary closing systems will be acceptable: Electric-operated pump; Air-operated pump; Hand-operated pump or nitrogen. Extensions with hand wheels are not mandatory.
14. Blowout preventer rams shall be of proper size for the drill pipe being used or production casing being run in the well. Variable type rams of the proper size range will be acceptable.
15. The gas buster and flare system shall be in place and operable prior to drilling into a reservoir known or believed to contain Hydrogen Sulphide in excess of 500 ppm with the intention to complete in and/or test that reservoir.
16. A trip tank, or any accurate fluid monitoring system, as well as a gas buster and flare system where justified, shall be in place when penetrating the A2 Carbonate formation. Changes may be granted by the Department of Natural Resources District Geologist.

# APPLICATION FOR PERMIT TO: ☒ DRILL ☐ DEEPEN ☐ REWORK OR ☐ OPERATE A WELL

HW 0009

MAIL TO:  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028 LANSING MICHIGAN 48209

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION  
MAY RESULT IN FINES AND/OR IMPRISONMENT

## BY AUTHORITY OF:

1a ☐ Act 61, P.A. 1939 as amended  
☐ Oil & Gas  
☐ Brine Disposal  
☐ Hydrocarbon Storage  
☐ Secondary Recovery

1b ☒ Act 315 P.A. 1969, as amended  
☐ Disposal ☐ Storage  
☒ Brine ☐  
☐ Test Well Type  
☒ Single ☐ Blanket

2 Application to: (no fee required if permit is valid)  
☐ Deepen ☐ Revise Application ☐ Cancel and Transfer ☐ Convert to ☐  
3 Fee enclosed: ☐ No ☒ Yes  
4 Do prior permits exist? ☐ No ☒ Yes ☐ Drilled ☐ Abandoned/Terminated

5 List each permit number  
~~1234~~  
6 Fed Employer Ident No or Soc Security No  
36-3545577  
7 Surety Bond: ☒ Blanket ☐ Single Well  
8 ☐ Attached ☒ On File  
9 Bond No C/O Bank of Montreal  
10 Bond Amount: \$25,000

11 Applicant: (name each "owner" as they are bonded)

Kalium Chemicals, Ltd.

12 Address: (operator only if more than one "owner")  
1395 135th Avenue  
Hersey, MI 49639

Phone: 616-832-3755

13 Lease or well name: (be as brief as possible)

Kalium Hersey

Well number: 1032

14 Surface owner:

Kalium Chemicals, Ltd.

15 Address: 1395 135th Avenue, Hersey, MI 49639  
Phone: 616-832-3755

16 Surface location (See instructions)

NW 1/4 SW 1/4 of NW 1/4 of Sec. 26 T. 17N R. 9W

Township Hersey

County Osceola

17 Bottom hole location if directional drill (See instructions)

SW 1/4 SE 1/4 of NW 1/4 of Sec. 26 T. 17N R. 9W

Township Hersey

County Osceola

18 LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT. (See instructions)

Surface  
a Location: 1274 ft from (N/S) S Line of quarter section AND 660 ft from (E/W) W Line of quarter section  
Bot Hole  
b Location: 60 ft from (N/S) S Line of quarter section AND 989 ft from (E/W) E Line of quarter section  
Drilling  
c Unit: N/A ft. from (N/S) Line of drilling unit. AND ft. from (E/W) Line of drilling unit

19 Drilling contractor: McLachlan  
20 Kind of tools (Rotary cable combination) Rotary  
21 Is sour oil or gas expected? ☐ No ☒ Yes  
22 Blowout control diagram enclosed? ☐ No ☒ Yes

23 Blowout control (Detail equipment type size trim rating testing choke manifold etc See instructions)  
See Attached Drawing

24 Intended Total Depth 7800 TD 8095 MD  
25 Formation at Total Depth A-1 Evaporite  
26 Producing Formation A-1 Evaporite  
27 Objective Pool or Field Hersey Potash

## 28 PROPOSED DRILLING, CASING, CEMENTING AND SEALING PROGRAM

HOLE				CASING		CEMENT		MUD		
Depth	Geol. Form	Bit Dia.	O.D. Size	Wt./Ft. — Grade — Condition	Depth	Sacks	W.O.C.(hrs.)	Wt.	Vis.	W.L.
800	MICH GR	17.5	13-3/8"	54.5 J-55-New	800	625	16	8.4	27	-
5250-5100 (TVD)	Amhstbg	12.25	9-5/8"	40-K55-New/Used	5250	1800	16	10.2	27	-
8000-7800	A-1 Evap	8.5	7"	23-L80-New	8000	300	16	10.4	34	2.6
MDNR62657-1 08/29/94 110-84-645 \$50.00										

29 Send correspondence and permit to: Address

Kalium Chemicals, Ltd., Attn: Lawrence Bean, 1395 135th, Hersey, MI 49639

FOR DNR USE ONLY

Permit Date Issued Number

Act 61  
Act 315 9.8.94 M-397

30 Application Prepared By: (Print)

Lawrence E. Bean

Phone: 616-832-3755

31 Signature: Lawrence E. Bean

Date: 8/10/94

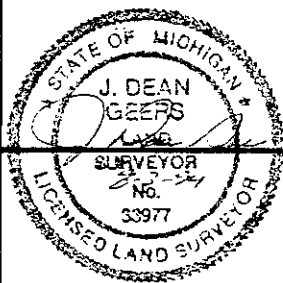
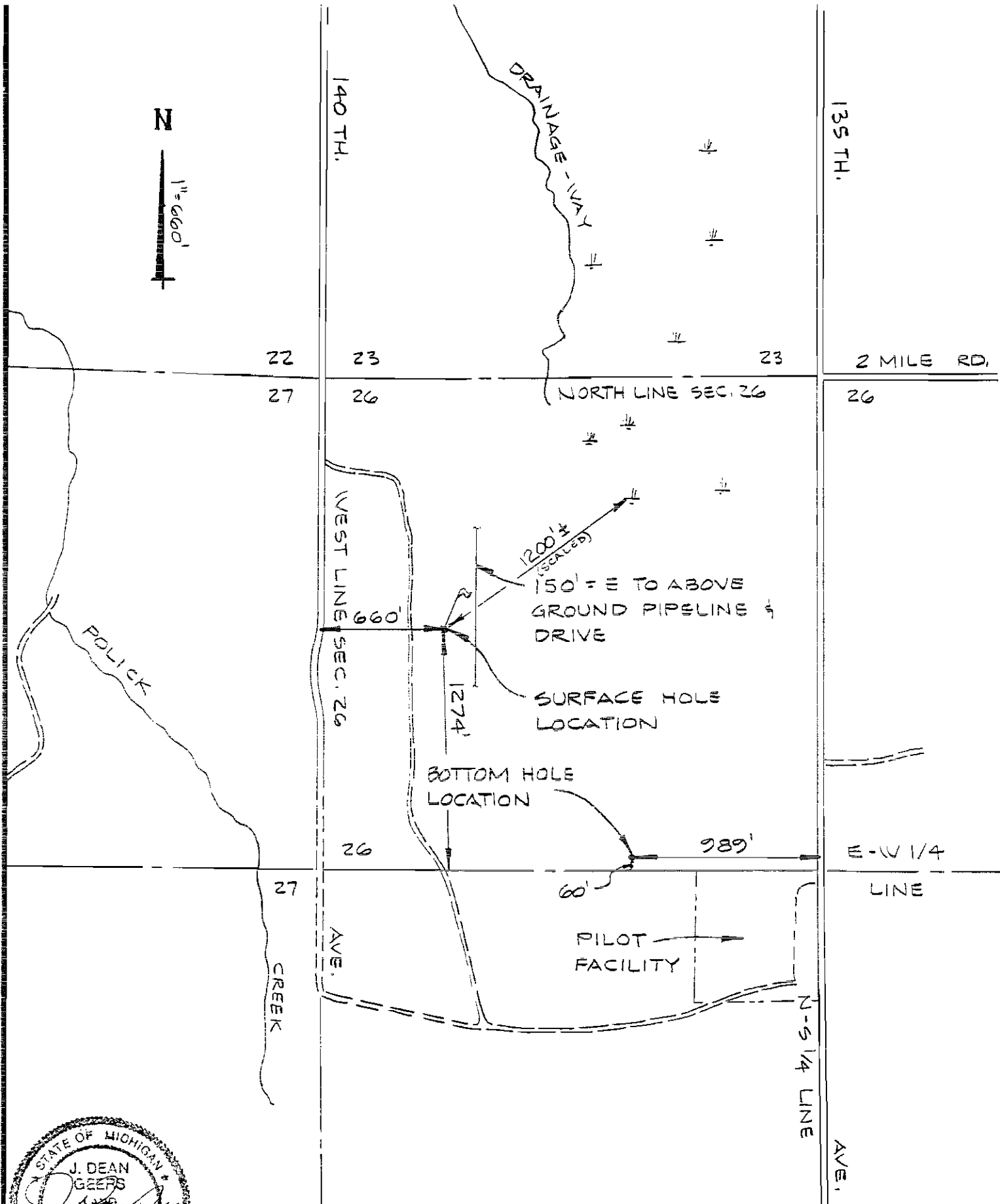
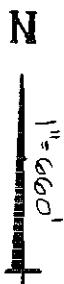
SURVEY RECORD OF WELL LOCATION

☒ Act 61, P.A. 1939, as amended. ☐ Act 315 P.A. 1969, as amended.

Filing of Survey Record, Plat or Plot Plan and Environmental Impact Assessment with Application for Permit to Drill are REQUIRED by the above listed Acts, in order to obtain a Permit

94375

APPLICANT <b>Kalium Chemicals, Ltd.</b>		WELL NAME AND NUMBER <b>Kalium Hersey #1032</b>	
SURFACE LOCATION <b>NW 1/4 of SW 1/4 of NW 1/4 of Section 26 T17N R9W Hersey</b>		COUNTY <b>Osceola</b>	
BOTTOM HOLE LOCATION <b>SW 1/4 of SE 1/4 of NW 1/4 of Section 26 T17N R9W Hersey</b>		COUNTY <b>Osceola</b>	
Instructions: Outline drilling unit and spot well location on Plat shown below (1). Where drilling unit crosses section lines, divide the Plat into an East half and a West half OR a North half and a South half (whichever applies). Outline the Unit and locate the well in two directions from NEAREST quarter section and unit lines (For Act 61, P.A. 1939, as amended).			
2. Location of well in two directions from NEAREST quarter section and unit lines is (For Act 61, P.A. 1939, as amended): Surface Location: <b>1274</b> ft. from <u>South</u> line of Quarter Section (north-south) <b>660</b> ft. from <u>West</u> line of Quarter Section (east-west) Bottom Hole Location: <b>60</b> ft. from <u>South</u> line of Quarter Section (north-south) <b>989</b> ft. from <u>East</u> line of Quarter Section (east-west) Bottom Hole Will Be: <b>N/A</b> ft. from _____ line of unit/property (Act 315) lease (north-south) _____ ft. from _____ line of unit/property (Act 315) lease (east-west)		1 PLAT BELOW REPRESENTS ONE FULL SECTION (1 MILE SQUARE)  SECTION 26 (Scale of Plat — 1 inch equals 1320 ft.)	
3a Describe wellsite marker. Show or describe access route if it is not readily accessible. <b>Wellsite is marked with a painted wood stake. Site can be reached from the Southeast, off of 135th Avenue, along an existing access trail to the site.</b>			
3b Zoning <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Other: <b>None in effect</b>			
3c. Effective date: _____			
4 ON SEPARATE PLAT OR PLOT PLAN, LOCATE, IDENTIFY AND SHOW DISTANCES TO: A All roads, power lines, residences, farm buildings, and other structures within 300 feet of the stake B All lakes, streams, swamps, drainage-ways or any other surface water features within 1320 feet of the stake			
5 In an ENVIRONMENTAL IMPACT ASSESSMENT describe all structures and surface features shown detailing plans for hazards prevention and erosion control (See instructions and guidelines for preparation of an environmental impact assessment).			
NAME OF INDIVIDUAL WHO SURVEYED SITE <b>J. Dean Geers</b>		DATE <b>8-3-94</b>	
TITLE <b>Professional Surveyor</b>			
WILCOX ASSOCIATES, INC. 7711 S US-131, Cadillac, MI 49601			
I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.			
SIGNATURE (Applicant or authorized representative) <b>Lawrence E. Dean</b>		DATE (Month Day Year) <b>8-9-94</b>	



SUPPLEMENTAL PLAT: KALIUM  
HERSEY #1032, SECTION 26,  
T17N-R9W, HERSEY TWP,  
OSCEOLA CO., MICHIGAN

CLIENT: KALIUM CHEMICAL LTD

8-2-74  
DRN R.M.  
CHD RDW  
SCALE  
V: 1"=660'  
H: 1"=660'

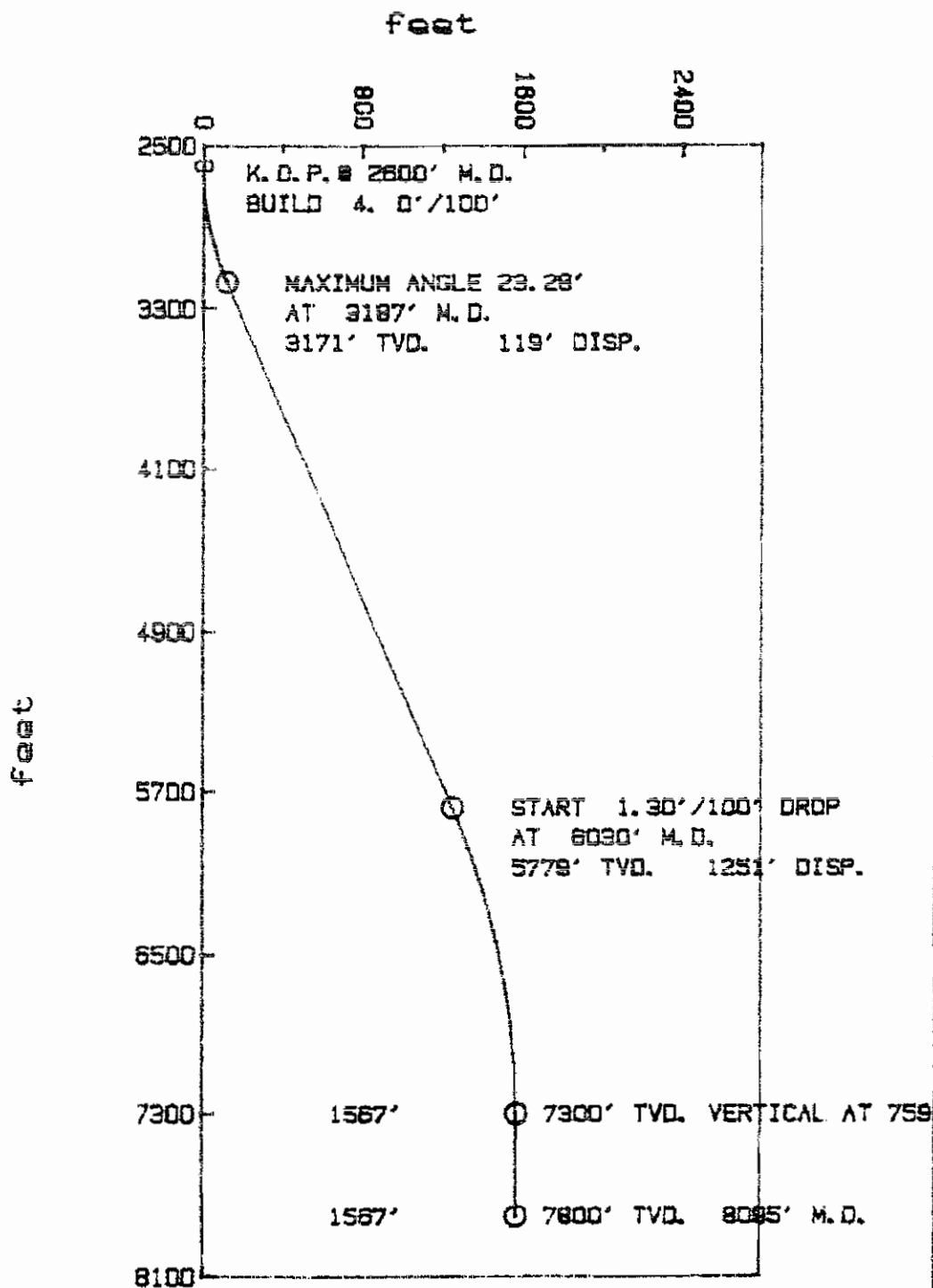
**Wilcox Associates**  
Engineering  
Surveying and  
Environmental  
Sciences  
P.O. Box 580  
7711 South US 131  
Cadillac, MI 49601  
816 775 7755

NOTES  
SHEET  
1 OF 1

JOB NO.  
94375

KALIUM CHEMICAL  
KALIUM HERSEY WELL # 1032  
HERSEY TOWNSHIP . OSCEOLA COUNTY

VERTICAL SECTION 1 IN. = 800 FT.



## KALIUM CHEMICAL

KALIUM HERSEY WELL # 1032  
HERSEY TOWNSHIP , OSCEOLA COUNTY

## OBJECTIVE NO. 1:

1567' S39.14'E OF  
SURFACE LOCATION  
7595' M.D. 7300' TVD.  
1214' SOUTH 991' EAST

PLAN VIEW  
1 IN. = 400 FT.

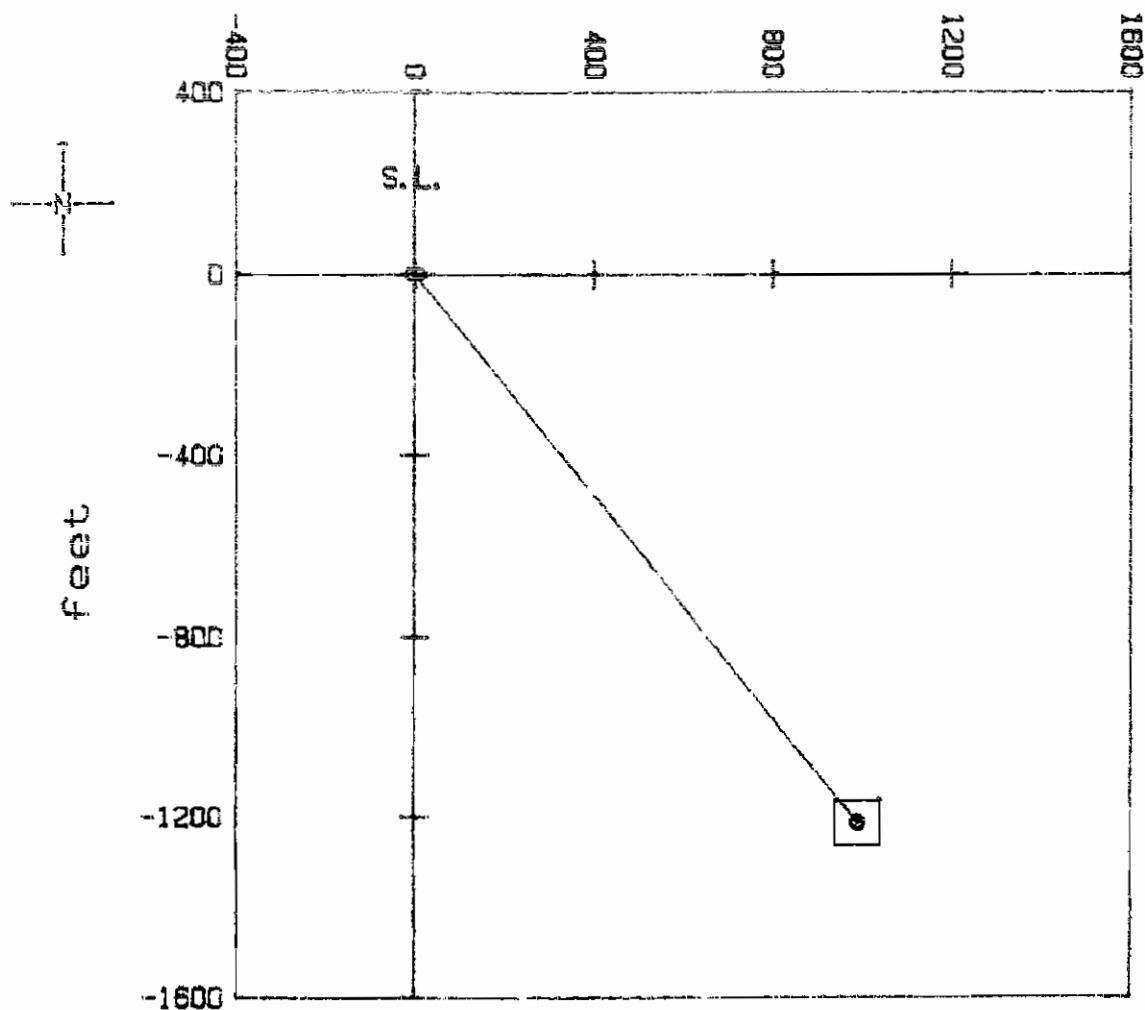
## OBJECTIVE NO. 2:

1567' S39.14'E OF  
SURFACE LOCATION  
8095' M.D. 7800' TVD.  
1214' SOUTH 991' EAST

SUBMITTED BY:

Directional Drilling Contractors, Inc.

100' X 100' TARGET  
feet



STATE OF MICHIGAN  
MINERAL WELL OPERATORS  
ENVIRONMENTAL IMPACT ASSESSMENT

**Well Identification**

Name and Address of Applicant:	<b>Kalium Chemicals, Ltd.</b> 11461 S. 135th Avenue P. O. Box 333 Hersey, MI 49639-9762
Well Name and Number:	<b>Kalium Hersey #1032</b>
Surface Location:	NW 1/4 of SW 1/4 of NW 1/4
Bottom Location:	SW 1/4 of SE 1/4 of NW 1/4 Section 26, T 17 N, R 9 W Hersey Twp., Osceola Co., MI

**I. Description of Project**

A development well is to be directionally drilled from a surface location 1274 feet from the South line and 660 feet from the West line of the Northwest 1/4 of Section 26, T17N, R9W, to a bottom hole location 60 feet from the South line and 989 feet from the East line of the same Northwest 1/4 of Section 26, T17N, R9W. The well will be directionally drilled from a new surface location with 30 inch conductor pipe. The well will be drilled to a total anticipated vertical depth of 8000 feet for the evaluation and production of sodium and potassium mineralization through the Niagaran Formation, with total depth in the A-1 Evaporite Formation. The well is located in the Northwest 1/4 of Section 26, T17N, R9W, Hersey Township, Osceola County, Michigan. Surface and mineral rights for the entire Northwest 1/4 of Section 26 are in private ownership and all concerned parties have been informed of the proposed well location and advised of our intentions to complete an application for a permit to drill this mineral well.

The proposed well is part of a project involving several other wells. All wells will be drilled from a common drilling pad area. The area will be on an extension to the South of the existing pad. The new pad area will extend 150 feet South of the existing pad and will require a moderate amount of earthwork for leveling and pad preparation. The land surrounding the wellsite is rolling, open, dormant field. Land use in the surrounding area is mixed agricultural and forest recreational. Natural topography at the site had been a ridge and drainage is both West and East. The drainage to the Northwest is toward Polick Creek, while that to the Northeast is toward Bull Hill Creek. Both creeks are over 1/4 mile away and are part of the Muskegon River watershed. There are no lakes or principal streams within 1/4 mile of the wellsite, however, there is a small seasonally wet area approximately 1200 feet Northeast of the location.



ENVIRONMENTAL IMPACT ASSESSMENT - MINERAL  
KALIUM - KALIUM HERSEY #1032  
PAGE 2

Access to the location will be from the Southeast, along an existing Kalium Chemicals, Ltd. road. This road originates at 135th Avenue, an all-season bituminous surfaced County road running along the North-South 1/4 line of Section 26. Emergency access is also available from the West off of 140th Avenue, a gravel surfaced County road located along the West line of Section 26.

## II. Environmental Impact Assessment

The drilling of the well at this location should have only a minor effect on the ecological system of the vicinity. Wildlife is abundant throughout the region, but no special or endangered species are known to exist in the vicinity of the proposed project. The proposed project should have only a slight effect on future population patterns.

The proposed project is for further development and production for solution mining operation purposes. A 7 inch casing will be set to the A-1 Evaporite and cemented back to 5500 feet, below the intermediate casing in this solution mining well.

A minimal disruption to the environment will result by concentrating this well in the same areas as those which have already been drilled. A total area of approximately 7-1/4 acres has previously been prepared and up to an additional 1/2 acre will be prepared for drilling this well and two future wells. Tree removal is not necessary to clear the drilling pad. Appropriate drill site drainage and sedimentation control measures have been incorporated in the operational plan. The new pad will be hard surfaced, as necessary, to provide containment of all drilling fluids. We have not experienced any unusual erosional problems at this location.

Due to environmental considerations, Kalium Chemicals, Ltd. does not plan to use conventional reserve pits. The well will be drilled using a pit liner rig base sealed around the cellar, rathole, and mousehole for containment of fluids. The following special measures will be taken in the handling of drilling solids and fluids. The drilling fluids will be circulated through closed-looped working pits. The solids control in the drilling fluid will be handled through a special flocculent and centrifuge system to provide effective separation of the brine from the drill cuttings. Brine will be disposed of in an approved disposal well. The semi-dry drill cuttings will be temporarily stored on an impervious barrier at the drilling location. The barrier will be sloped such that any leachate will collect at a central location to allow easy recovery and subsequent disposal in a disposal well. The volume of the containment area, including its side-dikes will be such, as to hold several days of precipitation, in addition to holding the drilling cuttings expected from the wells. Final disposition of the cuttings will be at an approved landfill site.

ENVIRONMENTAL IMPACT ASSESSMENT - MINERAL  
KALIUM - KALIUM HERSEY #1032  
PAGE 3

Access to the wellsite will be from the Southeast off 135th Avenue and will utilize the existing service road. Emergency access is also available from the West off 140th Avenue. No new access trail will need to be constructed.

Although other wells at this location have not encountered significant concentrations of hydrogen sulfide gas, intentions are to proceed as if the possibility does exist at this location. Appropriate safety measures will be taken. In general, the Administrative Rules for the Management of Hydrogen Sulfide, effective September 2, 1987, prepared by the Geological Survey Division of the Department of Natural Resources, will be observed. The site is well isolated from human habitation. There is only one residence within 1/4 mile of the wellsite, lying approximately 1/4 mile Southwest of the surface location.

An existing water supply well had been drilled for use in drilling the previous wells. This same water well will be used in drilling the proposed mineral well. Immediately following the drilling and completion operations of all wells which are part of this project, the well will be properly abandoned.

Upon completion of drilling and producing operations the well will be plugged in accordance with Michigan Department of Natural Resources instructions prior to abandonment. The drilling pad area will be fine graded, stabilized, and restored, as nearly as possible, to its original condition. This project is expected to have only a slight effect on the immediate environment.

### **III. Possible Alternatives to the Proposed Well Location**

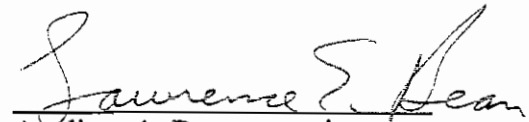
The proposed location has been selected on the basis of a geologic interpretation and an extensive on-site evaluation. By drilling this well from a common drilling pad with others, a minimal disruption of the environment will result. Preparation of the drilling pad will not require additional tree removal. No new access trail will be required. The proposed project area is well isolated from surface waters and human habitation. We believe the site is generally well suited for the undertaking of this project and that adequate protection of the environment can be maintained at this location. For these reasons, we believe that drilling the well from the surface location proposed is the best available alternative.

### **IV. Any Irreversible and Irretrievable Commitment of Resources**

The proposed project should not require a significant commitment of natural resources. The productivity of the land utilized for the drilling pad and access road will be lost during the life of the project, but the surface resources of the drill site will not be irreversibly committed. Drilling of the well will not curtail the use of the surrounding environment.

## V. Summary

In order to minimize surface disturbances, this development well is to be drilled from a common surface location which has been used for other wells in this 1/4 section. The total surface area necessary for this project encompasses approximately 7 3/4 acres. The drilling pad is located on rolling, generally open land. The drill site and the surrounding 7 3/4 acres are a part of the commercial potash solution mining facility operated by Kalium Chemicals, Ltd. Land use in the surrounding area is mixed agricultural and forest recreational. Natural drainage from the location is both Northeasterly and Northwesterly toward tributaries of the Muskegon River. There are no lakes or principal streams within 1/4 mile of the proposed wellsite, however, there is a small, seasonally wet area located approximately 1200 feet Northeast of the wellsite. Appropriate drill site drainage and sedimentation control measures have been included in the operational plan. Although it is not anticipated that sour gas will be encountered at this location, the intention is to proceed as if the possibility exists. Access to the wellsite will be from the Southeast off of 135th Avenue and will utilize the existing service road. Emergency access is also available from the West off of 140th Avenue. We consider the environmental impact of this project to be minimal, and will make every effort to insure protection and preservation of the environment during the course of our drilling and producing operations.

  
Applicant's Representative

Comments by Department of Natural Resources Representative:

---

Authorized Representative



**Kalium Chemicals** P.O. Box 290, 11461 South 135th Avenue  
Hersey, Michigan 49639 Telephone: (616) 832-3755 Fax: (616) 832-3349

Mr. William R. Lee  
Permit Coordinator  
Permits and Bonding Unit  
Geological Survey Division  
Department of Natural Resources  
P. O. Box 30256  
Lansing, MI 48909

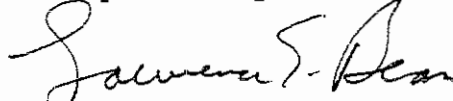
RE: Casing and Cementing Procedures for  
Kalium Hersey 1031 and 1032

1. Conductor pipe of 30 inch diameter will be driven to refusal in this well. Surface hole will be drilled with a 17-1/2" bit 100 feet into the competent rocks of the Michigan Group at a depth of approximately 800 feet. New 13-3/8 inch, 54.50 #/foot, J55 casing will be run to bottom with a Texas pattern shoe. The bottom three joints of casing will be strapped across the collars in three sections. The casing will be cemented with returns to surface. Wait on cement time will be 16 hours.
2. The 12-1/4 inch intermediate hole will be drilled directionally to the Amherstberg Formation (Black lime) at a depth of approximately 5250 feet (5100 feet T.V.D.) as local drilling shows no lost circulation zones deeper. Intermediate casing, new 9-5/8 inch, 40 #/foot, K-55 seamless casing, will be set at this depth and two stage cemented to surface as per cementers recommendations in line with accepted cementing practices.
3. The 8-1/2 inch production hole will be drilled into the A-1 Evaporite at a depth of approximately 8000 feet (7800 feet T.V.D.). The primary objective of this well is the evaluation and production of the potash mineralization of the A-1 Evaporite. The evaluation program will consist of coring the mineralized section of the A-1 Evaporite and appropriate geophysical logs. Production casing will be new 7 inch, 23 #/foot, L-80 seamless casing set in the A-1 Evaporite and cemented back to 5500 feet with premium cement.

leb200

4. After the well operations have ceased, it will be plugged and abandoned according to Department of Natural Resources requirements.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Lawrence E. Bean".

Lawrence E. Bean  
Minefield Supervisor

cc: Robert E. Thompson  
Jack Rokos  
William E. Booker, Acting Cadillac District Geologist

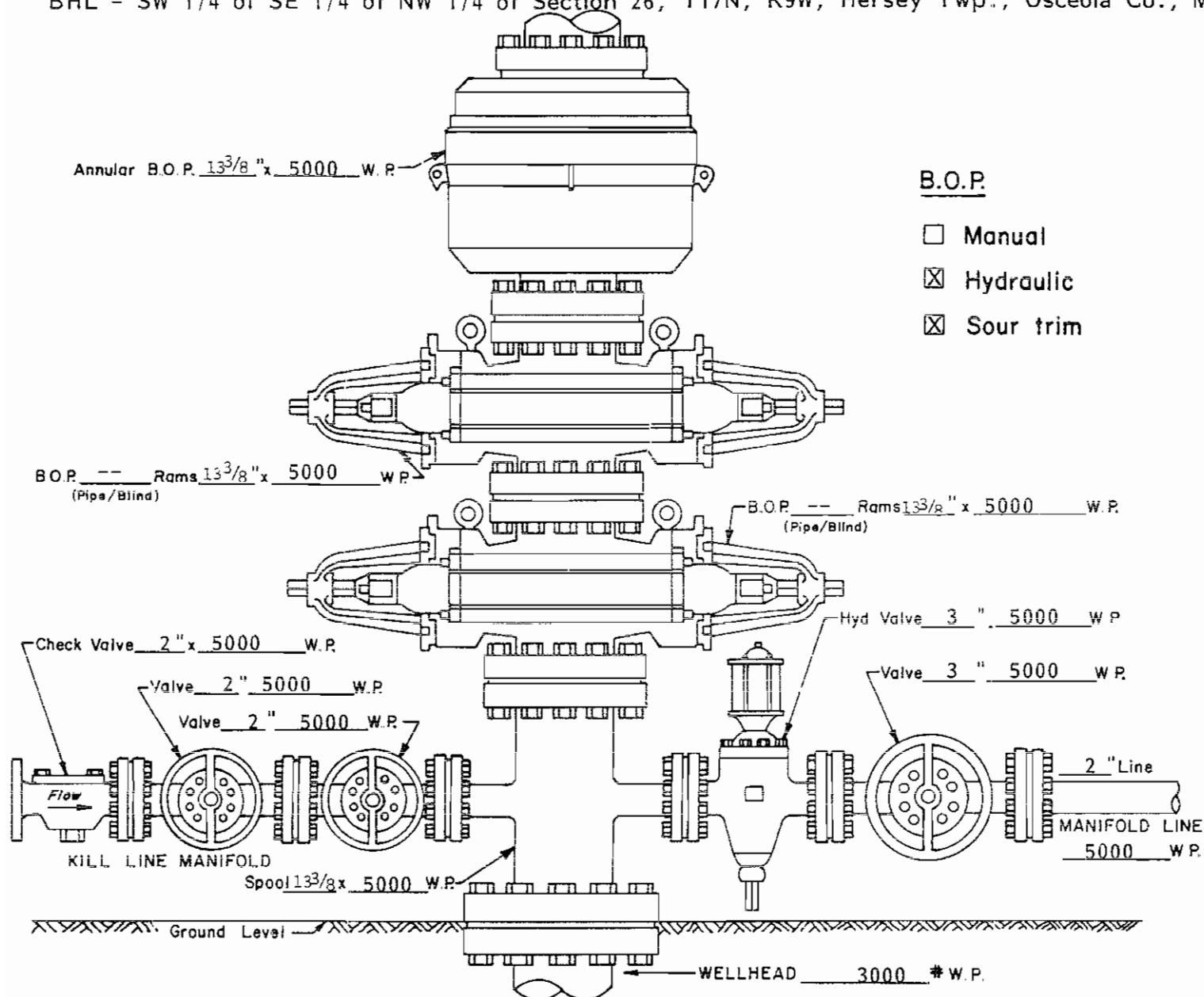
# WELLHEAD BLOWOUT CONTROL SYSTEM

Optional worksheet supplement for Application For Permit to Drill Deepen Rework or Operate a Well By Authority of Act 61 P.A. 1939 as amended or Act 315 P.A. 1969 as amended

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
Box 30028  
Lansing, Michigan 48909

94375

COMPANY <b>Kalium Chemicals, Ltd.</b>	WELL NAME AND NUMBER <b>Kalium Hersey #1032</b>
LOCATION <b>SHL - NW 1/4 of SW 1/4 of NW 1/4 of Section 26, T17N, R9W, Hersey Twp., Osceola Co., MI</b> <b>BHL - SW 1/4 of SE 1/4 of NW 1/4 of Section 26, T17N, R9W, Hersey Twp., Osceola Co., MI</b>	



Fill blanks with applicable information. If not applicable, enter "N.A." or cross-out item shown. Enter other pertinent information below.

This BOP system to be used on surface casing while drilling to intermediate casing point.

SOUR GAS CONTINGENCY PLAN - PART II  
KALIUM HERSEY #1032  
SECTION 26, T17N, R9W,  
HERSEY TOWNSHIP, OSCEOLA COUNTY, MICHIGAN

RESIDENTS WITHIN 1/4 MILE OF WELLSITE

1. Douglas Dailey  
11431 S. 140th Avenue  
Hersey, MI 49639  
Phone: 616-832-4698

EMERGENCY TELEPHONE NUMBERS

<u>Name</u>	<u>Location</u>	<u>Number</u>
Company Personnel		
Larry Bean	Hersey, MI (Office)	616-832-3755
Don Purvis	Hersey, MI (Office)	616-832-3755
MDNR		
Hal Fitch	Cadillac, MI	616-775-9727
Raymond Vugrinovich	Lansing (Office) (Home)	517-334-6951 517-339-9547
Sheriff	Osceola County	911 or 616-832-2288
State Police	Reed City, MI	911 or 616-832-2221
Ambulance	Alpha 1 N. Patterson Road Reed City, MI 49677	911 or
Hospital	Reed City Hospital N. Patterson Road Reed City, MI 49677	616-832-3271
Fire Department	Hersey, MI	911 or 616-832-3255
Director of Emergency Services		
Dallas Jenks	Osceola Co. (Office) (Emergency)	616-832-6172 911
Pollution Emergency Alerting System (PEAS)		800-292-4706

SOUR GAS CONTINGENCY PLAN - PART II  
KALIUM - KALIUM HERSEY #1032  
PAGE 2

NEAREST PUBLIC TELEPHONE

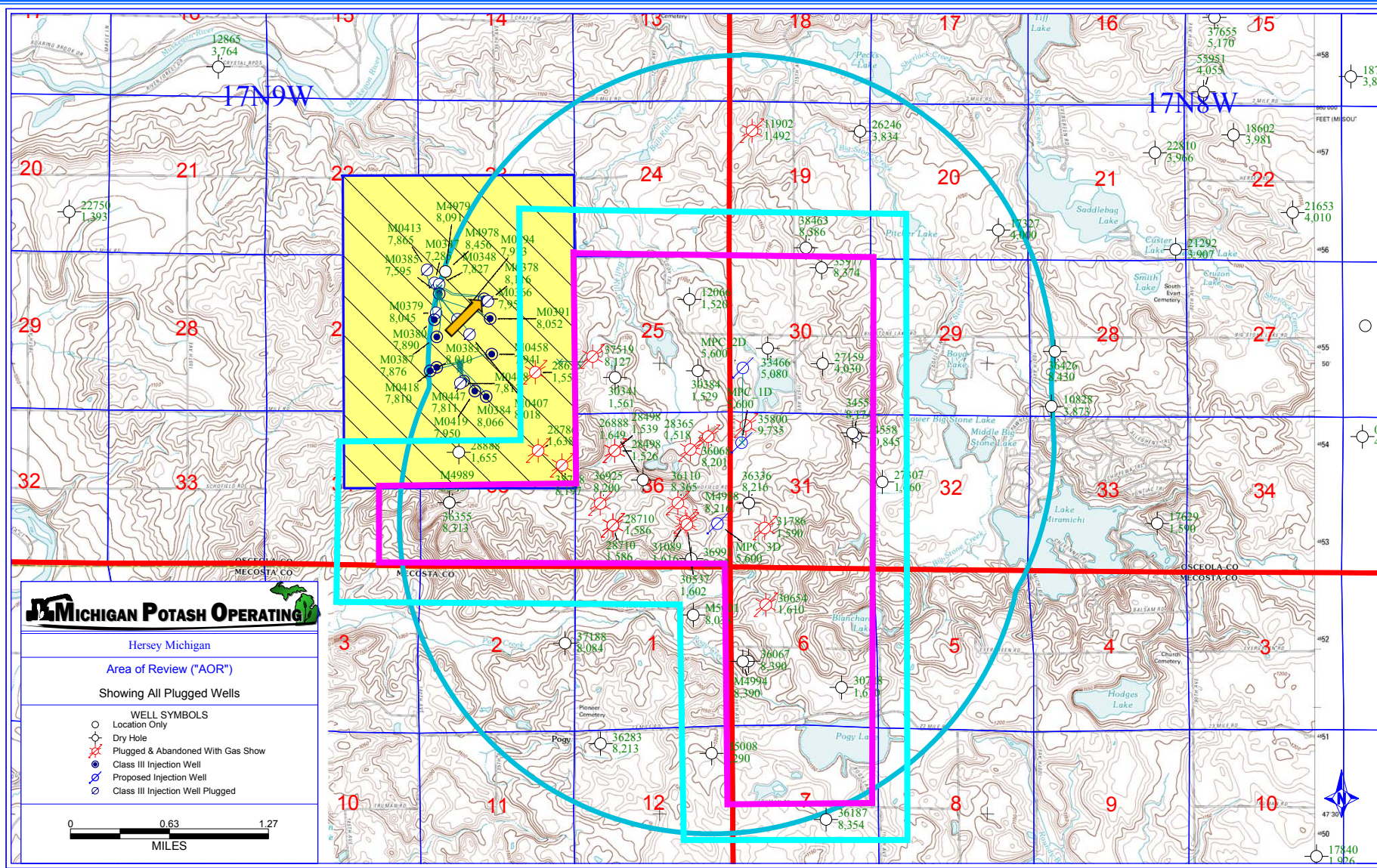
The nearest public telephone is located in front of the General Store in the town of Hersey. It is located North 1/2 mile on 140th Avenue, then West 4 miles on Hersey Road to the general store in the town of Hersey, on 180th Avenue.

MUD TREATMENT

A gas buster will be provided.

NOTE: For location of residences, public gathering places and evacuation routes, see vicinity map.

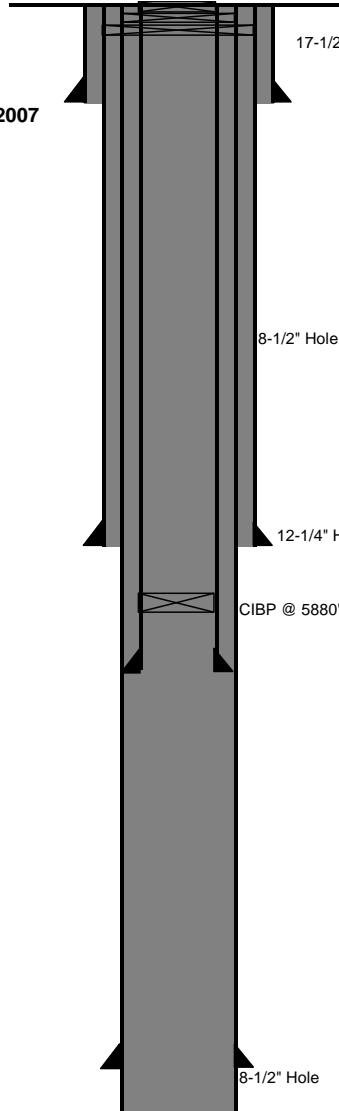




**KALIUM 1042**  
SW NW NW Sec 26 T17N R9W  
OSCEOLA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

PERMIT No. 378-855-767  
API No. 21-133-00378-70-00  
GL @ 1145.6'  
KB @ 1162.1'  
WELL COMPLETION DATE: 2/26/1985  
PLUGGING COMPLETION DATE: 11/5/2007

UPDATED APRIL 2014 BY JLT



**SURFACE CASING**

13 3/8", 54#/ft.  
SET @ 920' KB  
550 SX LITE + 200 SX CLASS A

**INTERMEDIATE CASING**

9 5/8", 40#/ft  
SET @ 5260' KB  
1450 SX LITE + 30 SX CLASS A

**PROD. CASING**

5", 18#/ft  
SET @ 6057' KB  
470 SX CLASS H

**PLUGGING**

5880' - 5580' CIBP @ 5880'; 25 SX CLASS A  
5580'-4980' 56 SX 50/50 POZ  
4980'-4380' 56 SX 50/50 POZ  
4380'-3780' 56 SX 50/50 POZ  
3780'-3180' 56 SX 50/50 POZ  
3780'-3180' 56 SX 50/50 POZ  
3180'-2580' 56 SX 50/50 POZ  
2580'-1980' 56 SX 50/50 POZ  
1980'-1380' 56 SX 50/50 POZ  
1380'-780' 56 SX 50/50 POZ  
780'-300' 46 SX 50/50 POZ  
300'-SURFACE 25 SX CLASS A  
CUT OFF WELL HEAD AND CAP 5", 7" AND 9-5/8" CASING

**INTERMEDIATE CASING**

7", 23#/ft  
SET @ 7890' KB  
1010 SX POZ + 235 SX CLASS A

PBTD @ 7920' KB  
TD @ 8116' KB

**KALIUM 1042 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
2/24/1985	SPUD.
11/5/2007	DRILLING COMPLETED.
	13 3/8" SET AT 920'; 550 SX LITE + 200 SX CLASS A
	9 5/8" SET AT 5260'; 1450 SX LITE + 300 SX CLASS A
	7" SET AT 7890'; 1010 SX POZ + 235 SX CLASS A
	5" SET AT 6057'; 470 SX CLASS H
11/2/2007	PLUGGING START DATE
5/13/1999	SET CIBP @ 5880'
11/2/2007	5880' - 5580' CIBP @ 5880'; 25 SX CLASS A
11/5/2007	5580'-4980' 56 SX 50/50 POZ
	4980'-4380' 56 SX 50/50 POZ
	4380'-3780' 56 SX 50/50 POZ
	3780'-3180' 56 SX 50/50 POZ
	3180'-2580' 56 SX 50/50 POZ
	2580'-1980' 56 SX 50/50 POZ
	1980'-1380' 56 SX 50/50 POZ
	1380'-780' 56 SX 50/50 POZ
	780'-300' 46 SX 50/50 POZ
	300'-SURFACE 25 SX CLASS A
	CUT OFF WELL HEAD AND CAP 5", 7" AND 9-5/8" CASING
11/5/2007	PLUGGING COMPLETED

**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994, as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

Permit number 378-855-767	Well name and number Kalium 1042
API number MI-133-3G-A002	
Name and address of permittee Mosaic Potash Hersey 1395 135 <sup>th</sup> Ave Hersey Mi 49639	
Name and address of contractor/service company Mosaic Potash Hersey 1395 135 <sup>th</sup> Ave Hersey, Mi 49639	Type of well Solution Mining
	Field name Kalium (Mosaic Potash)
Surface location SW 1/4 NW 1/4 NW 1/4 Sec 26 T 17N R 9W	
Township Hersey	County Osceola
Date plugging/change started 11/2/2007	Date plugging/change completed 11/5/2007

☐ Part 615 Oil/Gas Well ☒ Plugging  
☒ Part 625 Mineral Well ☐ Change of Well Status

DEQ employee issuing plugging permit or approving Change of Well Status

Raymond Vugrinovich

Date issued

5/21/2007

Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse

WELL PLUGGING (Hole conditions after plugging)							
CASING							
Casing size		Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled			
13 3/8"	54#	920'	0				
95/8"	42#	5260'	0				
7"	23#	7890'	0				
5"	18#	6057'	0				
PLUGS							
Depth of plug Bottom Top		Make and type of bridge or plug	Cement plugs: type amount of cement & mix water	Additives type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N
5880'	5580'	CIBP @ 5880'	25 Sacks Class A	None	FW/ 21.5 BBL	60 HRS	Y
5580'	4980'		56 Sacks 50/50 Poz	None	FW/ 19 BBL	0	N
4980'	4380'		56 Sacks 50/50 Poz	None	FW/ 16.9 BBL	0	N
4380'	3780'		56 Sacks 50/50 Poz	None	FW/ 14.6 BBL	0	N
3780'	3180'		56 Sacks 50/50 Poz	None	FW/ 12.3 BBL	0	N
3180'	2580'		56 Sacks 50/50 Poz	None	FW/ 9.9 BBL	0	N
2580'	1980'		56 Sacks 50/50 Poz	None	FW/ 7.6 BBL	0	N
1980'	1380'		56 Sacks 50/50 Poz	None	FW/ 5.3 BBL	0	N
1380'	780'		56 Sacks 50/50 Poz	None	FW/ 3 BBL	0	N
780'	300'		46 Sacks 50/50 Poz	None	FW/ 1 BBL	0	N
300'	Surface		25 Sacks Class A	None	0	0	N
<input type="checkbox"/> Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse.							
<input type="checkbox"/> Check if cores were taken and attach core descriptions							

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well.

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

COMPLETE BOTH SIDES



<b>API number</b> MI-133-3G-A002	<b>Permit number</b> 378-855-767
-------------------------------------	-------------------------------------

### CHANGE OF WELL STATUS

Change was to:	<input type="checkbox"/> Convert current zone to:	<input type="checkbox"/> Remediate well:	<input type="checkbox"/> Plugback (recomplete as)	<input type="checkbox"/> Redrill:
	<input type="checkbox"/> Production <input type="checkbox"/> Disposal <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Storage <input type="checkbox"/> Other _____	<input type="checkbox"/> Perf and test existing zone <input type="checkbox"/> Repair casing/cement <input type="checkbox"/> Other _____	<input type="checkbox"/> New production zone <input type="checkbox"/> Disposal <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Storage <input type="checkbox"/> Other _____	<input type="checkbox"/> Horizontal drain hole <input type="checkbox"/> Collapsed casing <input type="checkbox"/> Underream open hole <input type="checkbox"/> Other _____

### Well casing record - BEFORE change

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well casing record - AFTER change (Indicate additions and changes only, complete test record)

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### BEFORE CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

### AFTER CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

### DAILY PRODUCTION TEST RECORD

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure	
				Tubing	Casing

### DAILY INJECTION TEST RECORD ☐ Injection well ☐ Brine disposal

Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
		Beginning	Ending	

### DAILY CHRONOLOGY

Describe in detail the daily chronology of change/plugging, include days shut down. Describe exceptions to issued plugging instructions. Describe tools, tubing, etc. left in hole and any logs run. Include dates pits filled, surface restored etc. Use additional pages as needed.

Date	Narrative
5/13/1999	Set CIBP @ 5880'
11/2/2007	Set 25 Sacks of Class A @ 5880' Lay down pipe and wait on cement over the weekend.
11/5/2007	Tag plug @ 5580' Set 56 Sacks of 50/50 Poz @ 5580' and L/D pipe. Set 56 Sacks of 50/50 Poz @ 4980' and L/D pipe. Set 56 Sacks of 50/50 Poz @ 4380' and L/D pipe. Set 56 Sacks of 50/50 Poz @ 3780' and L/D pipe. Set 56 Sacks of 50/50 Poz @ 3180' and L/D pipe. Set 56 Sacks of 50/50 Poz @ 2580' and L/D pipe. Set 56 Sacks of 50/50 Poz @ 1980' and L/D pipe. Set 56 Sacks of 50/50 Poz @ 1380' and L/D pipe. Set 46 Sacks of 50/50 Poz @ 780' and L/D pipe. Set 25 Sacks of Class A @ 300' and L/D pipe. Cement to surface. Cut off well head and Cap 5 inch, 7 inch and 9 5/8 inch casing.

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (printed or typed) William C Hicks (Minefield Supervisor)	Authorized signature 	Date 11/13/2007
---	--	--------------------

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.



## Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

### FIELD PLUGGING SUMMARY

COMPANY Mosiac Pot Ash DATE 11-2-07 JOB # \_\_\_\_\_  
WELL NAME Hersey NO 1042  
LOCATION Hersey Plant COUNTY Osceola STATE MI TWP Hersey  
CONTRACTORS NAME Mosiac  
JOB DESCRIPTION Plug to Abandon

PLUG TO ABANDON	PLUG #	PLUG #	PLUG #	PLUG #	PLUG #	PLUG #
SIZE OF PIPE IN HOLE	5 1/8"	1				
CALCULATED TOP OF PLUG FT.	5580					
DEPTH TO BOTTOM OF PLUG FT.	5580					
SACKS OF CEMENT USED	25					
SLURRY VOLUME USED BBL S	5.2					
TYPE OF CEMENT USED	A					
AVER. SLURRY WT. LB./GAL.	15.6					
TYPE OF SPACE USED	RW					
FEET OF FILL IN HOLE	300					
SIZE OF TUBING USED	2 3/8					
TUBING VOLUME DISP. BBL.	21.5					

SQUEEZE DATA \_\_\_\_\_ DEPTH OF SQUEEZE ENTRY \_\_\_\_\_  
NO. OF SACKS SQUEEZED \_\_\_\_\_ MAX PSI OF SQUEEZE \_\_\_\_\_  
PROCEDURE USED Rig to 2 3/8 Tubing & B. Circulation Spot 25 Sbk Cmt  
@ 5580' w/ 21.5 BBLs Disp To H Above Cmt Top & Rev  
40 BBLs RW Rig Down

TOTAL MATERIAL USED 25 Sbk Class A Cement

DATE OF JOB COMPLETED 11-2-07 TICKET NO 2378  
PUMP # 156 BULK # \_\_\_\_\_  
CEMENTER J. STAHL  
COMMENTS \_\_\_\_\_

THANK YOU!



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

## FIELD PLUGGING SUMMARY

COMPANY Miosina Potash DATE 11-5-07 JOB # 1042  
 WELL NAME Hersey Plant NO. 1042  
 LOCATION Hersey COUNTY Osceola STATE MI TWP. Hersey  
 CONTRACTORS NAME Miosina  
 JOB DESCRIPTION Plug to Abandon

PLUG TO ABANDON	PLUG # 1	PLUG # 2	PLUG # 3	PLUG # 4	PLUG # 5	PLUG # 6
SIZE OF PIPE IN HOLE	5	5	5	5	5	5
CALCULATED TOP OF PLUG FT.	4780	4380	3780	3180	2580	1980
DEPTH TO BOTTOM OF PLUG FT.	5580	4986	4380	3780	3180	2580
SACKS OF CEMENT USED	56	56	56	56	56	56
SLURRY VOLUME USED BBLs	10.6	10.6	10.6	10.6	10.6	10.6
TYPE OF CEMENT USED	50/50	50/50	50/50	50/50	50/50	50/50
AVER. SLURRY WT. LB./GAL.	15.4	15.4	15.4	15.4	15.4	15.4
TYPE OF SPACE USED	FW	FW	FW	FW	FW	FW
FEET OF FILL IN HOLE	600	600	600	600	600	600
SIZE OF TUBING USED	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8
TUBING VOLUME DISP. BBL.	19	16.7	14.6	12.3	9.9	7.6

SQUEEZE DATA \_\_\_\_\_ DEPTH OF SQUEEZE ENTRY \_\_\_\_\_  
 NO. OF SACKS SQUEEZED \_\_\_\_\_ MAX PSI OF SQUEEZE \_\_\_\_\_  
 PROCEDURE USED \_\_\_\_\_

TOTAL MATERIAL USED 494 SLS 50/50 POZ  
25 SLS CLASS A CEMENT

DATE OF JOB COMPLETED 11-5-07 TICKET NO. 2379  
 PUMP # 156 BULK # 703  
 CEMENTER LA SITH  
 COMMENTS \_\_\_\_\_

THANK YOU!



# Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858

Phone: 989/775-0940 • Fax: 989/773-0943

midstatetools@msn.com

## FIELD PLUGGING SUMMARY

COMPANY Mosine Potash DATE 11-5-07 JOB #

WELL NAME Harvey #1A-T NO 1042

LOCATION Harvey COUNTY Oscoda STATE MI TWP. Harvey

CONTRACTORS NAME Mosine

JOB DESCRIPTION Plug to Abandon

PLUG TO ABANDON	PLUG # 7	PLUG # 8	PLUG # 9	PLUG # 10	PLUG #	PLUG #
SIZE OF PIPE IN HOLE	5	5	5	5		
CALCULATED TOP OF PLUG FT.	1380	780	300	Surface		
DEPTH TO BOTTOM OF PLUG FT.	1480	1380	780	300		
SACKS OF CEMENT USED	56	56	46	25		
SLURRY VOLUME USED BBLs	10.6	10.6	8.8	5.2		
TYPE OF CEMENT USED	50/50	50/50	50/50	A		
AVER. SLURRY WT. LB./GAL.	15.4	15.4	15.4	13.6		
TYPE OF SPACE USED	FW	FW	FW	FW		
FEET OF FILL IN HOLE	600	600	480	300		
SIZE OF TUBING USED	2 3/4	2 3/4	2 3/4	2 3/4		
TUBING VOLUME DISP. BBL.	5.3	3	1	0		

SQUEEZE DATA DEPTH OF SQUEEZE ENTRY

NO. OF SACKS SQUEEZED MAX PSI OF SQUEEZE

PROCEDURE USED

TOTAL MATERIAL USED 494 SL 50/50 Poz

25 SRS Class A Cement

DATE OF JOB COMPLETED 11-5-07 TICKET NO 2379

PUMP # 156 BULK # 703

CEMENTER JD STANL

COMMENTS

THANK YOU!





## APPLICATION TO:

- ☐ CHANGE WELL STATUS OR  
☒ PLUG AND ABANDON WELL

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994 as amended Non-submission and/or falsification of this information may result in fines and/or imprisonment

☐ Part 615 Oil or Gas Well ☒ Part 625 Mineral Well

Change of well status requested to:

- ☒ Plug back ☐ Perforate ☐ Temporarily abandon  
☐ Convert to ☐ Other

Last production/injection rate and type of fluid

May 1995/ 300 g.p.m./ Recycle brine

Brief description of project

Set 5 inch bridge plug and plug back to surface and cut and cap casing 3' below around level

Work to be done by

Mosaic Potash Hersey

Permit number

378 ~~855~~ - 767

Type of well

Solution Mining

API number

MI-133-3G-A002

Name and address of permittee

Mosaic Potash Hersey

1395 135<sup>th</sup> ave

Hersey MI 49639

Well name and number

1042

Well location

SW 1/4 of NW 1/4 of NW 1/4 Section 26 T 17N R 9W

Township

Hersey

County

Osceola

Date drilling completed

2/24/1985

Date last produced/utilized

May 1995

Starting date

6/1/2007

## CASING AND CEMENTING RECORD

Hole dia	Casing dia & wt/ft	Depths set	Cement quantity, type, additives	Cement top	Perforations
17 1/2	13 3/8 54#	920	550 sacks lite and 200 sacks of class A	Surface	
12 1/4	9 5/8 42#	5260	1450 sacks lite and 300 sacks of class A	Surface	
8 1/2	7 23#	7890	1010 sacks poz and 235 sacks of class A	Surface	
	5 18#	6057	470 sacks class H	Surface	

Formation record (formation and depth of top, oil, gas and water shows, etc.):

formation

depth

Detail proposed procedures:

Set a bridge plug in 5 inch casing below 5765 T V D Set the first plug of 75 sacks of class A on top of bridge plug. Pull the tubing through the cement and then tag the top of the plug to verify it's location. Start plugging back to surface in 600 foot increments using 50/50 poz cement up to 300 feet Set the final 30 sack plug of class A cement from 300' to surface Cut and cap the casing 3' below ground level

Name/signature (authorized representative):

*Robert Schuster*

Date:

5/18/07

FOR OFFICE OF GEOLOGICAL SURVEY USE ONLY

DEQ additional requirements:

☐ Yes ☒ No ☐ Not applicable Production tests to commence within 10 days of completion and to be filed

☒ Yes ☐ No Service company records are to be filed

Approved by DEQ:

*Raymond Vignaroli*

Office:

LANSING

Approval date:

5/21/2007

Termination Date:

5/21/2008

Submit original and three (3) copies of this application to the District Office within 60 days of change of well status

Note: Three copies of Record of Well Plugging or Change of Well status (EQP 7200-8) and any requested service company records are to be filed within 60 days of completion at the District Office

**REQUEST FOR TRANSFER OF PERMIT**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.


☐ Part 615 Oil/Gas Well☒ Part 625 Mineral Well

Permit number 378-855-767	Well type Brine Prod.	Current true vertical depth 7597
Well name and number Kalium 1042		
Surface location SW 1/4 NW 1/4 NW 1/4 Section 26 T 17N R 9W		
Township Hersey		County Osceola


NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13).

**This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.**

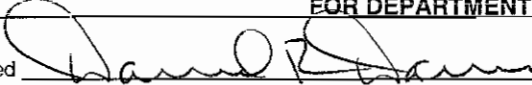
**TRANSFER OF A PERMIT FROM:**

Name(s) of Selling Permittee(s) Kalium Chemicals, Limited		Fed. ID # or S.S.# 38-3545577	
Address: Number and Street, City or Town State, ZIP Code Telephone 1395, 135th Avenue Hersey, MI, 49639		231-832-3755	
All permits rights and responsibilities are discharged by:			
Kalium Chemicals, Limited Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**TRANSFER OF A PERMIT TO:**

Name(s) of Acquiring Permittee(s): IMC Potash Hersey Inc.		Fed. ID # or S.S.# ME0132184	
Address: Number and Street, City or Town State ZIP Code 1395, 135th Avenue Hersey, MI, 49639		Telephone 231-832-3755	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <u>Royal Bank of Canada</u>			
<input checked="" type="checkbox"/> Blanket <input checked="" type="checkbox"/> On File Bond Number <u>P43087C00008</u> Amount <u>\$25,000</u>			
<input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
IMC Potash Hersey Inc. Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY**

Approved  Signature	MAY 08 2001 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner	
---	---------------------	--	--

STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing Michigan 48909

Filing for change of ownership of well is required in accordance with ☐ Act 61 P A 1939 and ☒ Act 315 P A 1969 as amended and Administrative Rules promulgated thereunder

TYPE OR PRINT

PERMIT NO. <u>378</u> <u>848-855-867</u>	WELL TYPE <u>Solution Mining</u>
FIELD NAME	
WELL NAME AND NUMBER <u>Kalium 1042 (formerly PPG 1042)</u>	
WELL LOCATION <u>SW 1/4 NW 1/4 SECTION 26 T 17N R 9W</u>	
TOWNSHIP <u>Hersey</u>	COUNTY <u>Osceola</u>

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Industries, Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One PPG Place Pittsburgh, PA 15272 (412) 434-2841

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Industries, Inc. R.J. Samelson

R.J. Samelson 9/6/88

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Kalium Chemicals, Ltd.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

11126 South 140th Avenue Hersey, MI 49639 (616) 832-3206

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling operation and abandonment in conformity with the law regulations and orders

SURETY BOND:

☐ SINGLE WELL

☐ ATTACHED

BONDING CO

☒ BLANKET

☐ ON FILE

BOND NUMBER

L/C Bank of Montreal

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Kalium Chemicals, Ltd. Donald D. Metzger

Donald D. Metzger 9-19-88

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

DISTRIBUTION BY DNR

- ☒ Lansing  
☐ Acquiring Owner  
☐ Selling Owner  
☐ Field

APPROVED

Stephen J. Lyszkowski  
Signature

10/17/88  
Date

STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing Michigan 48909

Filing for change of ownership of well is required in accordance with ☐ Act 31 P.A. 1939 and ☒ Act 315 P.A. 1969 as amended, and Administrative Rules promulgated thereunder

PERMIT NO 048-841-367	WELL TYPE Mineral Exploration
FIELD NAME	
WELL NAME AND NUMBER Kalium 1042 (formerly PPG 1042)	
WELL LOCATION SW 1/4 NW 1/4 SECTION 26 T. 17N R. 9W	
TOWNSHIP Hersey	COUNTY Osceola

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Industries, Inc.

ADDRESS: Number and Street — City or Town — State — Zip Code — Telephone

One PPG Place, Pittsburgh, PA 15272

(412) 434-2841

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Industries, Ltd., R.J. Samelson

*R.J. Samelson* 9/6/88

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Kalium Chemicals, Ltd.

ADDRESS: Number and Street — City or Town — State — Zip Code — Telephone

11126 South 140th Avenue Hersey, MI 49639

(616) 832-3206

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling operation and abandonment in conformity with the law regulations and orders

SURETY BOND:

☐ SINGLE WELL

☐ ATTACHED

BONDING CO

☒ BLANKET

☐ ON FILE

BOND NUMBER

*1/c Bank of Montreal*

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Kalium Chemicals, Ltd., Donald D. Metzger

*Donald D. Metzger* 9-19-88

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*Stefan J. Lyszkowski*  
Signature

*10/17/88*  
Date

DISTRIBUTION BY DNR

☒ Lansing

☐ Acquiring Owner

☐ Selling Owner

☐ Field

**MINERAL WELL PERMIT**  
**For a Brine, Storage, or Waste Disposal Well**

Permit Number

378-048-855-767

Date Issued

9/9/85

Permission is hereby granted to PPG Industries, Inc.

(Name)

One PPG Place,, Pittsburgh, PA 15272

(Address)

to convert & operate

(Type of Operation)

solution mining

(Type of Mineral Well)

to be located in SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$  Section 26, T17N, R9W, Hersey Twp., Osceola County

WELL NAME	WELL NUMBER	FORMATION	INTENDED DEPTH
	1042	Niagaran	8000'

ELEVATION	RB	RF	RT	GR

**SPECIAL INSTRUCTIONS:** Well is to be drilled in accordance with Supervisor of Wells Letter of Instruction #1-84. same surface as Permit #048-841-367

Permit is subject to the provisions and requirements of Act 315, P.A. 1969, as amended, and rules, requirements, or orders issued by the Supervisor of Mineral Wells and the Department of Natural Resources.

SUPERVISOR OF MINERAL WELLS BY: David H. Bechler David H. Bechler  
Coordinator, Permits & Bonds Unit P.O. Box 30028, Lansing MI 48909, 517-373-9290  
**NOTICE**

- 1 This permit is issued on the basis of the approved program outlined in the application. No change or alteration is to be made without the permission and approval of the Supervisor of Mineral Wells or his authorized representative.
- 2 This permit shall be posted in a conspicuous place at the well location and remain posted until the operation is completed.
- 3 This permit will expire 6 months from date of issuance if operation has not commenced or if the operator has not requested and received an extension of time.
- 4 An unusual, unexpected, or difficultly-controllable large volume of oil, gas, brine or flowing fresh water or a condition hazardous to public health, safety or waters of the state shall be reported immediately to the Supervisor.

THE FOLLOWING SHALL BE NOTIFIED AT LEAST 24 HOURS  
PRIOR TO THE COMMENCEMENT OF OPERATIONS:

Cadillac Field Office 616-775-9727

**DISTRIBUTION:**  
LINEN-APPLICANT  
2 - LANSING  
3 - FIELD  
4 - APPLICANT

MW-67-85

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

APPLICATION FOR A MINERAL WELL PERMIT

To Drill, Operate, Convert, or Rework  
a Brine, Storage, Disposal, or Test Well.

By Authority of Act 315, P. A. 1969 <sup>29</sup> AUG 29 1985

1. DATE OF APPLICATION	2. FEE ENCLOSED \$50.00
3. APPLICATION TO Convert to Mineral Well	
4. TYPE MINERAL WELL Solution Mining	5. WELL DESIGNATION #1042
6. LOCATION: SW 1/4 of the NW 1/4 of the NW 1/4 SEC 26 T 17N R 9W	
7. TOWNSHIP Hersey	8. COUNTY Osceola

9. APPLICANT PPG Industries, Inc.		10. TELEPHONE (412) 434-2841
11. ADDRESS (Street, City, State) One PPG Place, Pittsburgh, PA		12. ZIP CODE 15272
13. SURETY OR SECURITY COMPANY Hartford Accident & Indemnity	14. TYPE <input type="checkbox"/> SINGLE <input checked="" type="checkbox"/> BLANKET	15. AMOUNT \$25,000
17. OWNER OR SURFACE RIGHTS PPG Industries, Inc.	16. BOND NO. 4506230	
19. DRILLING CONTRACTOR	20. ADDRESS PPG Industries, Inc.	21. TELEPHONE
22. TYPE DRILLING TOOLS <input type="checkbox"/> CABLE <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> COMBINATION	23. FORMATION Niagaran	24. INTENDED Approx. 8000'
25. PROJECT ENGINEER OR GEOLOGIST Donald D. Metzger	26. ADDRESS 2250 Enterprise Drive, Mt. Pleasant, MI 48858	27. TELEPHONE (517) 773-3949

28. PROGRAM OF DRILLING CONVERTING REWORKING, CASING, CEMENTING, COMPLETING, OPERATING AND MONITORING.  
(See appropriate instruction sheet. Attach 3 copies of proposed program - including but not necessarily limited to information requested in the instruction sheet.)

CASING PROGRAM:  
Size Depth Cement

Attachments

- Environmental Impact Assessment
- Drilling Program
- Completion Program
- Operation
- Monitoring

INSTRUCTION SHEET NO.		
Type of Well	Drill-New	Rework*
Brine	D-1	R-1
Storage	D-2	R-1
Disposal	D-3	R-1
Solution Mining	D-4	R-2 X
Test Well	D-5	R-1

\* Rework, Deepen, or Convert to New Use

THERE WILL BE NO CHANGES IN THE PROGRAM OUTLINED IN THIS APPLICATION WITHOUT APPROVAL OF THE SUPERVISOR OF MINERAL WELLS OR HIS AUTHORIZED REPRESENTATIVE.

29. ADDRESS CORRESPONDENCE AND PERMIT TO: R. J. Samelson, PPG Industries, Inc., One PPG Place, Pittsburgh, PA 15272	30. TELEPHONE (412) 434-2841
--	---------------------------------

MINERAL WELL SECTION USE ONLY

STATUS OF BOND OK
APPLICATION APPROVED BY David H. Beckler
PERMIT NUMBER 367 048-855- <del>367</del> 367
DATE ISSUED 9/9/85
ISSUED BY David H. Beckler

The Applicant agrees to comply with provisions and requirements of Act 315, P.A. 1969, and asserts that the information on this application and attached report is true and correct

SIGNATURE (APPLICANT/AUTHORIZED REP.) R. J. Samelson	DATE 8/13/85
NAME (TYPED) R. J. Samelson	
TITLE Manager Environmental Programs	

DISTRIBUTION:  
White - Lansing  
Canary - Field  
Pink - Applicant

396 50.00

FOR CASHIER'S USE ONLY

R 7500 2/73

# SURVEY RECORD OF WELL LOCATION

(Submit five copies with Application for Permit to Drill a Well for Oil or Gas,  
Brine Disposal, Hydrocarbon Storage or Secondary Recovery)

84471

LESSOR (OWNER OF LEASE RIGHTS) PPG INDUSTRIES, INC.		WELL NO. 1042	
LESSOR (OWNER OF MINERAL RIGHTS) Willmet, Inc.		(PPG 1042)	
LOCATION SW ¼ OF NW ¼ OF NW ¼ SECTION 26 T. 17 N R. 9 W			
TOWNSHIP Hersey		COUNTY Osceola	
PLAT BELOW REPRESENTS ONE FULL SECTION (1 Mile Square)		<ol style="list-style-type: none"> <li>Outline drilling unit and spot well location on plat at left. Where drilling unit crosses section lines, divide the plat into an east half and a west half OR a north half and a south half (which ever applies) Outline the unit and locate the well in two directions from NEAREST quarter section and unit lines.</li> <li>Location of well in two directions from NEAREST quarter section and unit lines is: SURFACE LOCATION 1049 ft. from North line of Quarter Section (north-south) 650 ft from West line of Quarter Section (east-west) ____ ft from ____ line of unit (north-south) ____ ft from ____ line of unit (east-west)</li> <li>Describe wellsite marker Show or describe access route if it is not readily accessible. <u>Wellsite is marked with a painted wood stake. Access is from the West off 140th Avenue. See supplemental plat.</u> <u>Ground Elev. = 1146.7', U.S.G.S. datum.</u></li> </ol>	
REVISION ① ACTUAL DIMENSIONS 8185			
(Scale of Plat - 1 inch equals 1320 ft.)			

## 4 ON SEPARATE PLAT OR PLOT PLAN:

- Locate, identify, and show distances to all roads, power lines, residences, farm buildings, and other structures within 300 feet of the stake;
- Locate, identify, and show distances to all lakes, streams, swamps, drainage ways or any other surface water features within 1320 feet of the stake.

5. In an ENVIRONMENTAL IMPACT ASSESSMENT describe all structures and surface features shown detailing plans for hazards prevention and erosion control (See instructions and guidelines for preparation of an environmental impact assessment).

NAME OF INDIVIDUAL WHO SURVEYED WELL SITE Jerry L. Wilcox, LS#14102		DATE 10-23-84	TITLE President
ADDRESS J. L. WILCOX & ASSOCIATES, INC. 7230 North U.S.-131 Manton, MI 49663			
I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF			
SIGNATURE (LESSEE OR AUTHORIZED REPRESENTATIVE)	ADDRESS (IF DIFFERENT THAN LESSEE)	DATE (MONTH, DAY, YEAR)	



Exhibit C

135 TH.

N

1" = 660'

140 TH.

2 MILE

26 RD

22

23

23

27

26

NORTH LINE SEC.

BOTTOM HOLE

SURFACE LOCATION

650'

1049'

2279.13'

WEST

WEST LINE SEC. 26

27

26

E-W 1/4

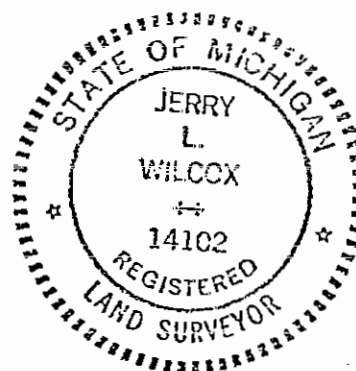
LINE

POLICK

CREEK

N-S 1/4 LINE

AVE.



REVISION ① ACTUAL  
DIMENSIONS 8/85

SUPPLEMENTAL PLAT: PPG 1042  
SECTION 26, T17N-R2W  
HERSEY TOWNSHIP, OSCEOLA  
COUNTY, MICHIGAN

CLIENT: PPG INDUSTRIES, INC.

DATE  
12-13-84

ORN.  
R.M.

CHD  
R.M.

SCALE  
V: N.T.S.  
H: N.T.S.

J.L. WILCOX & ASSOCIATES, INC.  
Engineers and Surveyors  
7230 N. U.S. - 131 • Manton, Michigan 49683

NOTES  
F.B. 172  
PG. 20-22

SHEET  
1 OF 1

JOB NO.  
84399



STATE OF MICHIGAN  
MINERAL WELL OPERATORS  
ENVIRONMENTAL IMPACT ASSESSMENT

Well Identification

Name of Applicant: PPG Industries, Inc.  
Address: 2258 Enterprise Drive  
Mt. Pleasant, Michigan 48858  
\*Well Name and Number: PPG #1042  
Location: SW1/4 of NW1/4 of NW 1/4  
Section 26, T17N, R9W  
Hersey Twp., Osceola County, Michigan

I. Description of Project

The PPG #1042 well was directionally drilled from a surface location 1049 feet from the North line and 650 feet from the West line of the Northwest 1/4 of Section 26, T17N, R9W, to a bottom hole location 1538.27 feet from the North line and 2279.13 feet from the West line of the same Northwest 1/4. The well was drilled to a total anticipated vertical depth of approximately 8000 feet. The surface and bottom hole are both located in the Northwest 1/4 of Section 26, T17N, R9W, Hersey Township, Osceola County, Michigan. This application is for a permit to convert Well #1042 from an exploratory well to a solution mining well. Surface and mineral rights for the entire Northwest 1/4 of Section 26 are owned in fee by PPG Industries, Inc. or under lease to PPG Industries, Inc.

This well is for the purpose of testing the solution mining technology for the production of potash bearing brines. This area has already been cleared and leveled for purposes of drilling exploratory mineral wells. The land surrounding the wellsite is rolling, open, dormant field. Land use in the surrounding area is mixed agricultural and forest recreational. Natural topography at the site had been a ridge and drainage is both Northwest and Northeast. The drainage to the Northwest is toward Polick Creek while that to the Northeast is toward Bull Hill Creek. Both creeks are over 1/4 mile away and are part of the Muskegon River watershed. There are no lakes, swamps or principal streams within 1/4 mile.

Access to the location will be from the West off 140th Avenue and utilizes the existing service road. One Hundred Fortieth Avenue is a gravel surfaced county road located along the West line of Section 26.

\* Permit to Drill No. 048-841-367

## II. Environmental Impact Assessment

The drilling of the wells at this location should have only a minor effect on the ecological system of the vicinity. Wildlife is abundant throughout the region, but no special or endangered species are known to exist in the vicinity of the proposed project. The proposed project should have only a slight effect on future population patterns.

The proposed project is intended for solution mining testing. Seven inch production casing will be set to the A-1 Evaporite and cemented back to surface.

No significant disruption to the environment will result since the drilling area is that previously cleared and paved for those wells which have already been drilled. A drilling pad area of approximately 1-1/4 acres has been prepared for drilling all the wells. Extensive tree removal was not necessary to clear the drilling pad. Because of the relatively large area included in the project, a slight amount of earthwork was needed to level the entire area. A Soil Erosion and Sedimentation Permit was acquired from Osceola County. Appropriate drillsite drainage and sedimentation control measures have been incorporated in the operational plan. Side slopes have been graded and are being seeded for stabilization. An asphalt pad has been laid in a 360' x 140' area around the drilled well and planned adjacent wells. This pad is sloped to provide drainage to the sealed cellar, which is routinely evacuated with a vacuum truck.

A mud pit system will not be required since this is an existing well and will also not be required for reworking/conversion purposes.

Access to the wellsite will be from the West off 140th Avenue and utilizes the existing service road. No new road will need to be constructed.

Since no hydrogen sulfide gas was encountered during the drilling, and since casing has been set, the possibility of encountering this material during rework/conversion operations can be ruled out.

Upon completion of solution mining operations, the well will be plugged in accordance with Michigan's Department of Natural Resource's instructions prior to abandonment. This project is expected to have only a slight effect on the immediate environment.

## III. Possible Alternative to the Proposed Well Location

The proposed bottom hole location has been selected on the basis of a geologic interpretation. The surface location has been chosen on the basis of an extensive on-site evaluation. By drilling this well from a common drilling pad with others, a minimum disruption of the environment will result. The proposed project area is well isolated from surface waters and human habitation. We believe the site is generally well suited for the undertaking of this project and that adequate protection of the environment can be maintained at this location. For these reasons, we believe that drilling the well from the surface location proposed is the best available alternative.

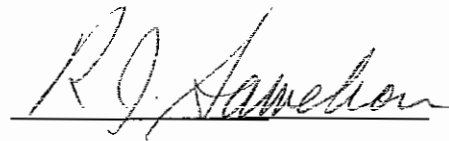
IV. Any Irreversible and Irretrievable Commitment of Resources

The proposed project should not require a significant commitment of natural resources. The productivity of the land utilized for the drilling pad and access road will be lost during the life of the project, but the surface resources of the drillsite will not be irreversibly committed. Drilling of the well will not curtail the use of the surrounding environment.

V. Summary

In order to minimize surface disturbances, this well has been directionally drilled from a common surface location which has been used for other wells in this 1/4 Section. The drilling pad area necessary for this project is approximately 1-1/4 acres. The drilling pad is located on rolling, generally open, dormant land. Land use in the surrounding area is mixed agricultural and forest recreational. Natural drainage from the locations is both Northeasterly and Northwesterly toward tributaries of the Muskegon River. There are no surface waters within 1/4 mile of the proposed wellsite. Appropriate drillsite drainage and sedimentation control measures have been included in the operational plan. We do not anticipate sour gas at this location. Access to the wellsite is from the West off 140th Avenue and utilizes the existing service road. We consider the environmental impact of this project to be minimal, and will make every effort to ensure protection and preservation of the environment during the course of our drilling and testing operations

Applicant's Representative



Comments by Department of Natural Resources Representative:

---

Authorized Representative

## Section 28 Solution Mining Well Program

### I. Drilling Program

A. Well No. PPG No. 1042 was drilled as follows:

1. Ninety-five feet of conductor pipe was driven. This would allow for the landing of a 20" conductor should washout below the 24" conductor pipe occur while drilling through the glacial drift.
2. A 17-1/2" hole was drilled to a firm footing as determined by geologists from samples.
3. A 13-3/8" S.T.C. 54.5# K-55 buttress casing equipped with Texas pattern weld-on shoe was run. A float collar was set one joint, off bottom. The lower 5 joints of casing were strapped across the collars in two or three sectors. Top and bottom cement plugs were run with no centralizer. See attached Exhibit "A" for additional detail.
4. A cement basket was run approximately 50' below surface to make sure that the cement would circulate back to surface.
5. A 12-1/4" hole was drilled to 5260'. Directional drilling was employed as per the attached Exhibit "B". Exhibit "C" shows the bottom hole location relative to the surface location. Directional surveys were run as required. Geophysical logs were run from the base of the surface casing to the intermediate casing point. These logs include those which provide information on lithology, porosity, and fluid characteristics.

A 9-5/8" I.T.C. 40# and 43 1/2# N-80 grade pipe was landed with a guide shoe on bottom and float collar at the first joint above, and the bottom six joints were secured with Weld-A. A stage collar was set at approximately 3400' from surface. Centralizers were run. The lower joints of casing were roughened to provide a better cement bond. See Exhibit "D" for additional details.

Pressure tests were completed after the intermediate casing had been run and after the blowout preventor equipment was installed on the 9 5/8" casing. The tests were run before the cement plugs were drilled out. The BOPE system was pressure tested for leaks, using the rig pump, to a pressure of 500-800 psi.

6. An 8-1/2" hole was then drilled from the base of the intermediate casing to 7920'. The drill pipe was removed from the hole and a complete pressure check of the blowout preventors and casing was run. The BOPE system is pressure checked to 5000 psig, the Hydril to 2500 psig and the Intermediate Casing to 80% of burst pressure. This was done as a precautionary measure in the event of encountering H<sub>2</sub>S Gas in the A-2 and/or A-1 Carbonate. At this stage a full H<sub>2</sub>S monitoring system was also installed on the rig.
7. Drilling continued into the top of the A-1 Evaporite, at which time a core barrel was picked up. A 4" core was then cut through the salt and potash beds of interest. The hole was then reamed with an 8-1/2" bit and deepened to the top of the Niagaran formation. Bottom hole location was verified by running a gyro survey. Monitoring for gas continued to total depth.
8. The core was then processed by PPG laboratory personnel.

#### 8. Drilling Fluid

Drilling through the glacial drift was accomplished with chlorinated fresh water mud in steel working pits with solids control equipment. The cuttings were discharged to the asphalt lined disposal area and the fluid hauled to a disposal well. The hole from the base of the surface casing to the Detroit River Salt, was drilled with fresh water using steel working pits. Mud system volume was maintained by fresh water makeup and solids content was controlled by solids removal equipment. The solids were discharged into the asphalt lined disposal area. The drilling fluid becomes saturated with NaCl while drilling through the salt sections. Saturated brine is then used to maintain mud system volume. Solids were removed by the solids control equipment and discharged into the asphalt lined disposal area. The 8-1/2" hole drilled from the base of the intermediate casing to the top of the A-2 Evaporite utilizes the brine-based mud system generated during drilling of the well to intermediate casing point. Saturated brine makeup was used. After encountering the A-2 Evaporite, the brine mud system was displaced from the hole into steel holding tanks and replaced by a polymix-NaCl saturated mud system which contains KCl. Mud system properties were maintained at low water loss, and at a desired viscosity, yield and weight. This mud system is used to drill to total depth. This mud system was then displaced back into steel holding tanks for use in drilling of another well. Excess fluid generated during drilling was disposed in a disposal well.

C. Safety Equipment

Attached as Exhibits "E" and "F" are the blowout control systems used for drilling to intermediate casing point and to total depth, respectively. Monitoring of H<sub>2</sub>S in the circulating drilling mud system is accomplished on a 24-hour basis by mud logging equipment. The additional H<sub>2</sub>S monitoring equipment, mentioned above, augments this system.

## II. Completion Program

### A. Casing and Tubing

<u>Hole</u>		<u>Casing</u>			
<u>Depth</u>	<u>Bit Dia.</u>	<u>O.D. Size</u>	<u>Wt./Ft.-Grade-Condition</u>	<u>Depth</u>	
95'	Drive	24"	0.412" Wall	New	95'
95-920'	17-1/2"	13-3/8"	48.0# H-40	New	920'
920-5260'	12-1/4"	9-5/8"	40.0# N-80	New	5260'
5260-7920'	8-1/2"	7"	17.0# N-80	New	7890'

### B. Down Hole Equipment

The 7" casing will be run in an 8-1/2" hole and set to approximately 7890'.

1. Use a guide shoe on bottom with manual fill float collar located one joint above the shoe. The guide shoe and float collar are locked on with Baker Lok or some similar material.
2. Run the centralizer into the middle of the first joint. The centralizer is held in place with a stop ring. The float shoe is centralized. Additional centralizers are run into the hole at points of high angle.
3. A short or marker joint is installed approximately 5-6 joints off bottom.
4. The mud system in the hole is circulated when the pipe is on bottom.
5. The casing is reciprocated while circulating and cementing. Reciprocation is stopped just prior to bumping the top plug.
6. A bottom (red) wiper plug is run, except if L.C.M. materials are being carried in the cement.

### C. Cement

The 7" casing is cemented as follows:

1. The well is plugged with cement up into the A-1 Salt to a point below where the 7" casing is to be landed.

2. Thirty barrels of fresh water were pumped ahead of the cement.
3. The cement volume, determined by calculating hole volume from the caliper log, required to bring the cement to surface was calculated. Single stage cementing was used, as recommended by the cementing company. Cementing was accomplished with:

1010 sacks regular poz., salt saturated  
235 sacks Class A, 5% KCL, 1% HALAD 322

#### D. Geophysical Logging

In addition to the logs run at intermediate casing point, gamma ray, neutron and other lithology indicating logs are run from the base of the intermediate casing to the top of the Niagaran formation. Later, when the cement plugs are drilled out to below the zone of mineralization, a series of cased hole-logs will be run. A cement bond log and collar locator will be run from total depth to surface. The depth of the casing is checked using a collar locator log to locate the marker joint.

#### E. Tests

The pressure testing of the 7" casing to 80% of burst pressure will take place prior to the initial mining. This pressure exceeds 133% of operating pressure. A packer will run to the bottom and the pressure checked in the final stages before mining commences.

#### F. Mining Interval

Mining will be commenced in the salt a short distance above the bottom of the 7" casing. The exact depth depends on the depth at which the potash bed is encountered.

#### G. Well Area

The wellhead will be within a concrete trench sump which will gravity drain through a steel pipe to another sump within a building in which pumps and other equipment will be located. Accumulation of any leakage in this sump will be pumped back into the circulating solution mining fluid.



### III. Operation

#### A. Well Operation:

##### 1. Single Well Operation

- a) Well No. 1042 will be operated initially as a single well with annulus injection and tubing withdrawal. Oil will be used as an inert pad to provide roof control and will be added as required. The well will be operated as a single well until the mined out cavity is large enough to connect with Well No. 1041. The well will then be converted to multi-well operation.

##### 2. Multi-Well Operation

- a) After Well Nos. 1041 & 1042 are connected, the wells will be operated as two well gallery. Either well may be operated as an injection or withdrawal well in the multi-well mode. Oil will continue to be used as required to provide roof control.

#### B. Operating Parameters

1. Injection flow will vary according to the stage that the cavity is in and the plant production requirements. During single well operation the injection flow will average less than 50 gpm. In multi-well operation the gallery flowrate will average as low as 75 gpm during certain stages and as high as 390 gpm during other stages. The gallery well may operate as high as 500 gpm for a short period of time.
2. Withdrawal flow will be approximately 97% of injection. No losses are anticipated to the formation.
3. Injection temperature will range from 50°F to 175°F.
4. Injection pressure will depend on the injection flowrate and the density difference of the injection and withdrawal fluids. It is anticipated that the injection pressure will range between 900 and 1545 psig.
5. Specific gravity of the withdrawal fluid will range between 1.2 and 1.25.
6. Chemical composition of the withdrawal fluid will depend on the ore being dissolved and is anticipated to range from nearly pure water to an aqueous solution of sodium chloride (NaCl) and potassium chloride (KCl) containing up to 435 gpl combined dissolved NaCl and KCl.
7. The injected fluids will be pretreated to reduce the dissolved oxygen concentration to less than 10 ppb for corrosion control purposes. Catalyzed Sodium sulfite or other commercially available chemicals will be used to scavenge the oxygen.

#### IV. Monitoring

##### A. Operating Parameters

The injection flowrate to each well will be continuously monitored by a totalizing flowmeter. The withdrawal flow from all wells will be combined and monitored with a continuous, totalizing meter. The chemical analysis of injection fluids and the withdrawal fluid from each individual well will be used along with the flowrates to determine a material balance on each well or gallery well.

##### B. Well Integrity and Solutioning Process.

1. The well head and surface equipment will be visually monitored by operations.
2. The condition of the borehole, casing, and cement sheath will be determined by monitoring the pressure when the well is operating. If any loss of fluid (other than expansion of the cavity) is indicated from a comparison of the injection and withdrawal flowmeters, pressure and/or video testing of the casing will be performed to locate leaks.

##### C. Surface Changes.

A network of benchmark monuments is being installed for the purpose of monitoring surface changes in the solution mining area. Baseline vertical control will be established before any solution mining is performed. The network includes monuments within an area covering approximately 7.5 square miles in and around the solution mining area, as well as several monuments located outside the intended mining area, which serve as reference benchmarks. Annual surveys will be conducted during the solution mining operation to ascertain any elevation changes on the surface. Reports will be mailed to DNR every two years.

## Exhibit A

### Surface Casing (13-3/8" in 17-1/2" hole @ 920')

1. Use insert float and Texas Pattern Shoe and lock to shoe joint with thread lock.
2. No centralizers.
3. Circulate hole a minimum of one complete circulation.
4. Do not reciprocate casing.
5. Run bottom (red) wiper plug. Do not use if carrying L.C.M. in cement.
6. Pump 70 bbls. fresh water ahead of cement.
7. Cement with:
  - a. 550 sacks HOWCO Lite, 3% CaCl
  - b. 200 sacks Class A, 3% CaCl

EKJG13/JG/1mk

## Exhibit D

### Intermediate Casing (9-5/8" in 12-1/4" hole @ 5260')

1. Use float collar and guide shoe and lock to shoe joint with Halliburton Weld-A.
2. Run one centralizer 10' above guide shoe and four more at every other collar spacing.
3. Circulate hole a minimum of one complete circulation and until the drag stabilizes.
4. Reciprocate casing while circulating and cementing. Stop reciprocation just prior to bumping to plug.
5. Run bottom (red) wiper plug. Do not use if carrying L.C.M. in cement.
6. Pump 30 bbls. fresh water ahead of cement.
7. Cement with enough cement from caliper log to bring cement to surface on all intermediate casing strings.
8. Run top (black) wiper plug.
9. Displace with fresh water.

**MINERAL WELL COMPLETION REPORT**  
TO BE FILED WITH THE SUPERVISOR WITHIN 60 DAYS  
AFTER COMPLETION OF WELL (ACT 315, P.A. 1969)

SUBMIT IN  
TRIPLICATE

NAME OF OWNER OR OPERATOR PPG OIL & GAS, INC.		ADDRESS OF OWNER OR OPERATOR 2258 Enterprise Drive Mt. Pleasant, MI 48858	
NAME OF DRILLING CONTRACTOR INDRIL, INC.		ADDRESS OF DRILLING CONTRACTOR PO Box 668 Mt. Pleasant, MI 48858	
WELL NAME PPG	WELL NUMBER 1042	PERMIT NUMBER 048-841-367	
LOCATION SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$	SECTION 26	TWP 17N	RANGE 9W
TOWNSHIP Hersey	COUNTY Osceola		
FOOTAGE 1049 Ft from North Line and 650 Ft from West Line of quarter section N or S E or W			
DATE DRILLING COMMENCED 01/20/85	DATE DRILLING COMPLETED 02/24/85	DATE WELL COMPLETED 02/26/85	TYPE OF WELL D-5 test well
FORMATION COMPLETED IN Niagaran	TOTAL DEPTH 8116 Dr; 8116 log;	ELEVATION KB 1162.1	RB RT RF GN 1160.7 1145.6
ROTARY TOOLS From 0 Feet to TD Feet		CABLE TOOLS From Feet to Feet	

**WELL CASING RECORD**

TUBING AND CASING DATA				CEMENTING DATA			PERFORATIONS OR OPEN HOLE		
SIZE	LB./FT.	GRADE	DEPTH	SACKS	TYPE	STAGING DEPTH(S)	NO. HOLES	FROM	TO
13-3/8"	54.5#	K-55	920	550 sx	lite, 200	sx C1 A			
9-5/8"	40/43.5#	N-80	5260	1st stage	505 sx	lite, 200 sx C1 A	(DV tool set @ 3700')		
				2nd stage	945 sx	lite, 100 sx C1 A			
7"	23#	L-80	7890	1010 sx	poz, 235	sx C1 A			
Plugged back with 60 sx C1 H; PSTD 7920'									

**WATER ZONES**

**WIRE LINE LOGS RUN**

FORMATION	FROM	TO	AMOUNT	SERVICE COMPANY	TYPE LOG	INTERVAL LOGGED	COPY TO SURVEY
(Fresh)				Schlumberger	LDT-CNL-GR	100-8113	Yes
None					DLL-MLL	3350-4300	"

**FRACTURE OR ACID TREATMENT**

**SOLUTION MINING**

DATE	FROM	TO	QUANTITY	NAME AND NUMBER OF INJECTION AND TARGET WELL - DISTANCE APART
None				

The information in and attached to this report is complete and correct

SIGNATURE <i>William E. Back</i>	TITLE Geologist	DATE 3/21/85
-------------------------------------	--------------------	-----------------

GIVE COMPLETE FORMATION RECORD ON REVERSE SIDE

**FORMATION RECORD**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

<b>ELEVATION USED:</b> <input type="checkbox"/> KB <input type="checkbox"/> RT <input type="checkbox"/> RF <input type="checkbox"/> GR	<b>GEOLOGIST NAME:</b>	<b>TOPS TAKEN FROM:</b> <input type="checkbox"/> SAMPLE LOG <input type="checkbox"/> ELECTRIC LOG
---	------------------------	--

FROM	TO	FORMATION (TYPE, COLOR, ETC.)	FROM	TO	FORMATION (TYPE, COLOR, ETC.)

IF WELL WAS CORED ATTACH CORE DESCRIPTION AND ANALYSIS

**LIST ATTACHMENTS:**

**GEOLOGICAL SURVEY USE ONLY**

REVIEWED BY

DATE OF COMPLETION

PPG OIL & GAS, INC.  
PPG #1042  
SW NW NW, Section 26, T17N R9W  
Hersey Township, Osceola County, MI

(All tops Schlumberger)

Base of Drift @ 616

- 616 - 670 Shale, red-gray, gummy soft.
- 670 - 844 Shale, gray to red, gummy; with sandstone, light gray, subround.
- 844 - 913 Sandstone, light gray, buff, fine grained, rounded to sub-rounded, poorly cemented.
- 913 - 1006 Shale, medium to dark gray, blocky, firm.

Kicked off @ 1000'

- 1006 - 1390 Sandstone, light gray, subangular, moderately well cemented; with shale, medium gray, firm; trace limestone.

Triple Gyp @ 1390

- 1390 - 1462 Anhydrite, white, firm; with shale, medium to dark gray, firm.

Brown Lime @ 1462

- 1462 - 1578 Limestone, medium to dark brown, very finely crystalline, slightly sucrosic; with shale, medium to dark gray.

Stray Sandstone @ 1578

- 1578 - 1714 Sandstone, white, very finely crystalline, subangular, calcareous cement, becoming red.

Marshall @ 1714

- 1714 - 1844 Sandstone, white to transparent, very fine grained, subangular to subround, moderately well cemented; with shale, medium gray to dark gray, firm, non-calcareous.

Coldwater Shale @ 1844

- 1844 - 2580 Shale, gray to gray-blue, firm, slightly calcareous.

Sunbury @ 2580

- 2580 - 2676 Shale, very dark brown to black, trace pyrite, trace spore cases, firm.

PPG OIL & GAS, INC.  
PPG #1042  
SW NW NW, Section 26, 117N R9W  
Hersey Township, Osceola County, MI

Page 2

Ellsworth @ 2676

2676 - 3082 Shale, dark to medium gray to gray-green, soft to firm.

Antrim @ 3082

3082 - 3254 Shale, dark brown to black, firm, very slightly calcareous, very organic.

Traverse Formation @ 3254

3254 - 3301 Shale, dark gray to brownish-black, firm, pyritic; inter-bedded with limestone, brown to tan, very finely crystalline.

Traverse Limestone @ 3301

3301 - 3824 Limestone, creme to tan, brown to dark brown toward base, very fine to finely crystalline, compact, trace intercrystalline porosity, no fluorescence or stain, argillaceous toward base.

Bell Shale @ 3824

3824 - 3882 Shale, gray, light gray, soft, non-calcareous.

Dundee @ 3882

3882 - 3942 Limestone, light to medium brown, tan, microcrystalline, tight, compact, argillaceous, no visible porosity.

3942 - 3952 Dolomite, medium brown, some light brown to buff, finely to very finely crystalline, slightly argillaceous, trace stain, no fluorescence or cut, 5-7% porosity average.

Reed City Anhydrite @ 3952

3952 - 3960 Anhydrite, white, firm.

Reed City Dolomite @ 3960

3960 - 3990 Dolomite, tan to light brown to medium brown, very finely crystalline, trace sucrosic texture, 7-11% porosity, very slightly argillaceous, no fluorescence, stain or cut.

3990 - 4040 Dolomite, medium to light brown, trace dark brown, 7-9%+ porosity, lighter portion very clean, no fluorescence or cut, good sucrosic porosity.



PPG OIL & GAS, INC.  
PPG #1042  
SW NW NW, Section 26, 117N R9W  
Hersey Township, Osceola County, MI

Page 3

4040 - 4120	Dolomite, medium brown, trace light brown, carbonaceous stain, 6% porosity, very finely crystalline, slight trace sucrosic texture, argillaceous.  <u>Detroit River Anhydrite @ 4120</u>
4120 - 4562	Anhydrite, white, firm.  <u>Detroit River Salt @ 4562</u>
4562 - 4591	Salt, with dolomite, light brown to brown, very fine to finely crystalline, argillaceous, very compact; with anhydrite.  <u>Sour Zone @ 4591</u>
4591 - 4720	Dolomite, light to medium brown, tan, very finely crystalline to microcrystalline, compact, 3-6% intercrystalline porosity.  <u>Massive Anhydrite @ 4720</u>
4720 - 4952	Anhydrite, white, firm; dolomite, tan to brown, micro-crystalline, trace stain and fluorescence, no cut.  <u>Base Anhydrite @ 4952</u>
4952 - 5028	Dolomite, light to medium brown, trace gray, very finely crystalline to microcrystalline, tight, no stain or fluorescence.  <u>Black Limestone @ 5028</u>
5028 - 5138	Limestone, dark brown to black to tan to buff, finely crystalline, trace intercrystalline porosity, argillaceous, wackstone, no stain or fluorescence.  <u>Sylvania @ 5138</u>
5138 - 5254	Sandstone, light brown to buff, fine grained, well cemented, subround, calcareous cement; with abundant limestone, tan to brown.  <u>Bois Blanc @ 5254</u>
5254 - 5412	Limestone, tan to gray-brown, very fine to finely crystalline, good porosity in part; with dolomite, dark gray to gray, microcrystalline; trace chert.

PPG OIL & GAS, INC.  
PPG #1042  
SW NW NW, Section 26, T17N R9W  
Hersey Township, Osceola County, MI

Page 4

Bass Islands @ 5412

5412 - 5708 Dolomite, gray-brown to light brown, no stain or fluorescence; trace anhydrite, white.

Salina @ 5708

5708 - 5718 Dolomite, gray-brown to dark brown, microcrystalline, compact, argillaceous.

F Unit @ 5718

5718 - 5760 Dolomite, dark brown, gray, very finely crystalline, compact, argillaceous.

F Salt @ 5760

5760 - 6320 Salt, with shale, gray, soft.

E Unit @ 6320

6320 - 6442 Shale, medium gray, calcareous, firm, trace intercrystalline porosity, moderately argillaceous; with dolomite, gray-brown.

D Salt @ 6442

6442 - 6482 Salt.

C Shale @ 6482

6482 - 6575 Shale, light to medium gray, trace red; dolomite, light to medium brown to red-brown, very finely to microcrystalline.

B Salt @ 6575

6575 - 6950 Salt, massive.

A-2 Carbonate @ 6950

6950 - 7090 Limestone, medium to light brown to gray-brown to dark brown, microcrystalline, tight, argillaceous; with dolomite, medium to light brown, very finely to microcrystalline.

A-2 Evaporite @ 7090

7090 - 7445 Salt, massive.

PPG OIL & GAS, INC.  
PPG #1042  
SW NW NW, Section 26, T17N R9W  
Hersey Township, Osceola County, MI

Page 5

A-1 Carbonate @ 7445

7445 - 7502 Dolomite, dark to very dark brown, very finely to micro-crystalline, argillaceous, tight; limestone, medium to dark brown.

A-1 Evaporite @ 7502

7502 - 7818 Salt, massive; no anhydrite.

Niagaran @ 7818

7818 - 7830 Limestone, medium to dark brown, medium gray, very finely to microcrystalline, argillaceous, tight, dense, no stain or fluorescence; trace of microlaminations.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

APPLICATION FOR A MINERAL WELL PERMIT

To Drill, Operate, Convert, or Rework  
a Brine, Storage, Disposal, or Test Well

By Authority of Act 315, P A 1969

1 DATE OF APPLICATION 12-13-84	2 FEE ENCLOSED \$1.00
3. APPLICATION TO Drill	
4. TYPE MINERAL WELL D-5 (Test Well)	5. WELL DESIGNATION PPG 1042
6 LOCATION: SW/4 of the NW/4 of the NW 1/4 SEC 26 T 17N R 9W	
7. TOWNSHIP Hersey	8 COUNTY Osceola

9 APPLICANT PPG Industries, Inc.		10. TELEPHONE 517-773-3949
11 ADDRESS (Street, City, State) 2258 Enterprise Drive, Mt. Pleasant, MI 48858		12 ZIP CODE 48858
13 SURETY OR SECURITY COMPANY Hartford Accident & Indemnity Co.	14. TYPE <input type="checkbox"/> SINGLE <input checked="" type="checkbox"/> BLANKET	15 AMOUNT \$25,000.00
17 OWNER OR SURFACE RIGHTS Willmet, Inc.	18 OWNER OR MINERAL RIGHTS Willmet, Inc.	
19 DRILLING CONTRACTOR INDRIL, Inc.	20 ADDRESS P.O. Box 642, Mt. Pleasant, MI 48858	21 TELEPHONE 517-773-6946
22 TYPE DRILLING TOOLS <input type="checkbox"/> CABLE <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> COMBINATION	23 FORMATION Niagaran	24 INTENDED DEPTH 8,000'
25. PROJECT ENGINEER OR GEOLOGIST D. D. Metzger	26 ADDRESS 2258 Enterprise Drive, Mt. Pleasant, MI 48858	27. TELEPHONE 517-773-3949

28 PROGRAM OF DRILLING, CONVERTING, REWORKING, CASING, CEMENTING, COMPLETING, OPERATING, AND MONITORING.  
(See appropriate instruction sheet. Attach 3 copies of proposed program - including but not necessarily limited to information requested in the instruction sheet)

CASING PROGRAM:  
Size Depth Cement

INSTRUCTION SHEET NO.		
Type of Well	Drill-New	Rework*
Brine	D-1	R-1
Storage	D-2	R-1
Disposal	D-3	R-1
Solution Mining	D-4	R-2
Test Well	D-5 X	R-1
*Rework, Deepen, or Convert to New Use		

Exhibits 1, 2, & 3 Enclosed

THERE WILL BE NO CHANGES IN THE PROGRAM OUTLINED IN THIS APPLICATION WITHOUT APPROVAL OF THE SUPERVISOR OF MINERAL WELLS OR HIS AUTHORIZED REPRESENTATIVE.

29. ADDRESS CORRESPONDENCE AND PERMIT TO: PPG Industries, Inc., 2258 Enterprise Drive, Mt. Pleasant, MI 48858	30. TELEPHONE 517-773-3949
--	-------------------------------

MINERAL WELL SECTION USE ONLY

STATUS OF BOND <i>Effective</i>
APPLICATION APPROVED BY <i>[Signature]</i>
PERMIT NUMBER 048-841-367
DATE ISSUED 12/28/84
ISSUED BY <i>[Signature]</i>

The Applicant agrees to comply with provisions and requirements of Act 315, P.A. 1969, and asserts that the information on this application and attached report is true and correct.

SIGNATURE (APPLICANT/AUTHORIZED REP) <i>[Signature]</i>	DATE 12-13-84
NAME (TYPED) Donald P. Smith	
TITLE Exploration Engineer	

DISTRIBUTION:  
White - Lansing  
Canary - Field  
Pink - Applicant

6054 1.00

FOR CASHIER'S USE ONLY

R 7500 2/73



PPG Industries, Inc. 2258 Enterprise Drive Mt. Pleasant, Michigan 48858 (517) 773-3949

December 13, 1984

Mr. Al Rarick  
Department of Natural Resources  
Geological Survey Division  
P. O. Box 30028  
Lansing, MI 48909

Dear Mr. Rarick:

Re: PPG Industries, Inc. Standard Casing and Cementing  
Procedures

Listed below are PPG Industries, Inc. standard casing and cementing procedures:

1. Drive 24" pipe as deep as possible. This allows us to set 20" conductor inside and lower if trouble occurs with washout under conductor pipe while drilling surface hole.
2. Drill 17 1/2" hole to base of drift or to a firm footing as determined by geologist from samples.
3. Run 13 3/8" S.T.C. 48# Seamless H-40 casing equipped with Texas pattern weld on shoe. A float collar is set 30', or one joint, off bottom. The lower 5 joints of casing are strapped across collar in either two or three sectors. Top and bottom cement plugs with no centralizer as recommended by cementing company (see attached).
4. We also run a cement basket approximately 50' below surface, making sure cement is circulated back to surface.
5. We then drill 12 1/4" hole into Bass Islands formation or the Amherstburg if local drilling shows no lost circulation zones in the Bois Blanc and set 9 5/8" L.T.C. 40# N-80 grade pipe with a guide shoe on bottom with float collar first joint up and all bottom 6 joints secured with Weld-A or Baker Lok or some similar material.
6. Centralizers are run per cementer's recommendation attached.
7. For both the surface and intermediate casings, the lower joints of casing are roughened unless they appear rusty as this provides a much better bond for cement.

Sincerely,

A handwritten signature in dark ink, appearing to read 'D. Smith', written over a horizontal line.

Donald P. Smith  
Exploration Engineer

DPS/blb  
Attachment

Exhibit #1

Surface Casing (13 3/8" in 17 1/2" hole @ 750')

- A. Use insert float and Texas Pattern Shoe and lock to shoe joint with thread lock.
- B. No centralizers
- C. Circulate hole a minimum of one complete circulation
- D. Do not reciprocate casing
- E. Run bottom (red) wiper plug. Do not use if carrying LCM in cement.
- F. Pump 70 bbls. fresh water ahead of cement
- G. Cement with:
  - 1. 475 sx 50/50 Poz., 6% total gel, 3%  $\text{CaCl}_2$   
1.54ft<sup>3</sup>/sk, 13.3#/gal, 7.66 gals/sk
  - 2. 200 sx Class "A", 3%  $\text{CaCl}_2$   
1.18 ft<sup>3</sup>/sk, 15.6#/gal, 7.66 gals/sk

Intermediate Casing (9 5/8" in 12 1/4" hole @ 5100')

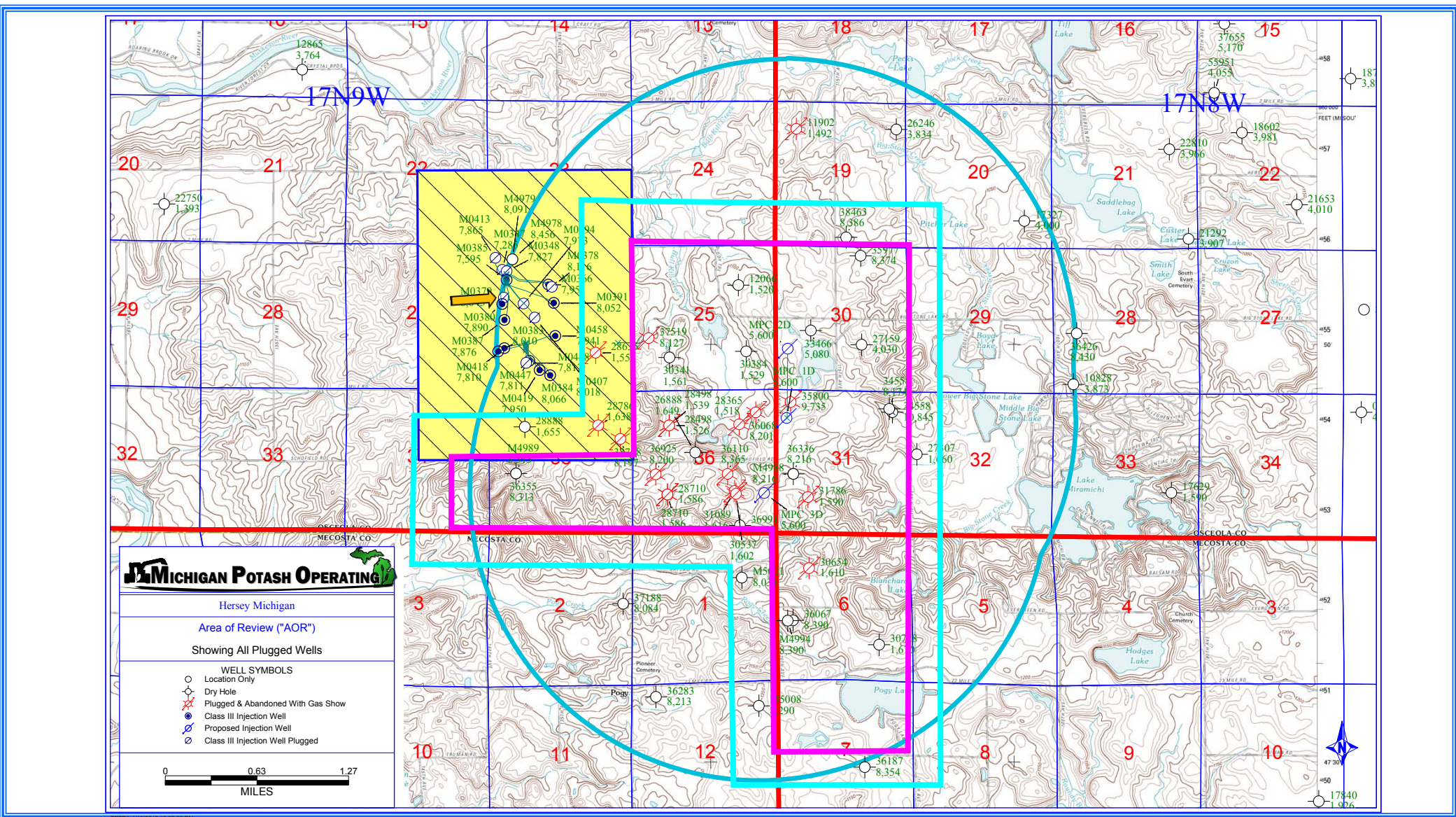
Recommended Procedure:

- A. Use float collar and guide shoe and lock to shoe joint with Halliburton Weld-A
- B. Run one centralizer 10' above guide shoe and four more at every other collar spacing.
- C. Circulate hole a minimum of one complete circulation and until the drag stabilizes.
- D. Reciprocate casing while circulating and cementing. Stop reciprocation just prior to bumping top plug.
- E. Run bottom (red) wiper plug. Do not use if carrying LCM in cement.
- F. Pump 30 bbls. fresh water ahead of cement.
- G. Cement with enough cement from caliper log to bring cement to surface on all intermediate casing strings.
- H. Run top (black) wiper plug.
- I. Displace with fresh water.

Casing Equipment: (9 5/8")

Regular guide shoe, float collar with auto fill, Halliburton weld-A (2), Centralizers (5)

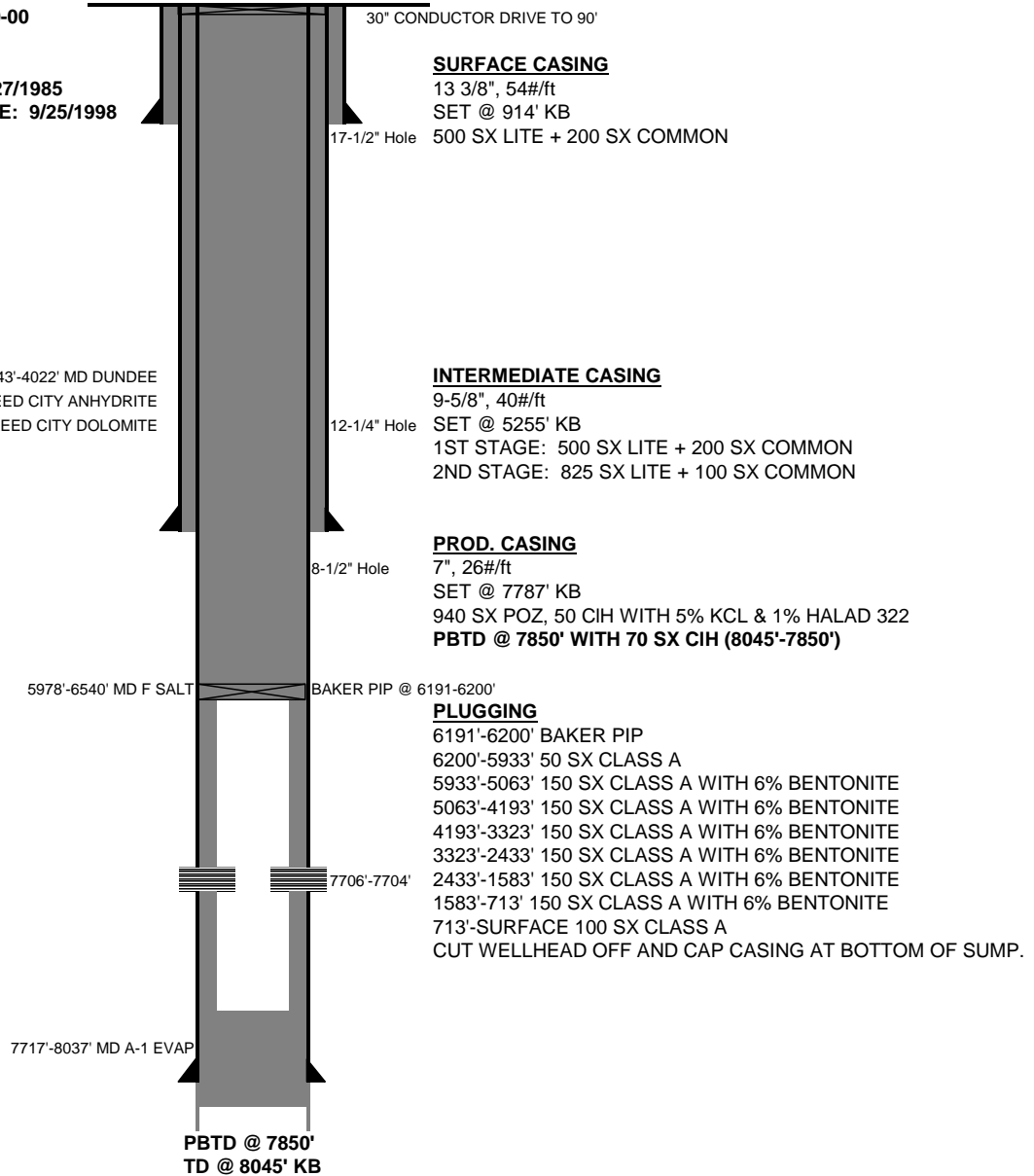




**KALIUM 1052**  
**SW NW NW Sec 26 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

PERMIT No. 00379  
API No. 21-133-00379-70-00  
GL @ 1145.6'  
KB @ 1162.1'  
WELL COMPLETION DATE: 3/27/1985  
PLUGGING COMPLETION DATE: 9/25/1998

UPDATED APRIL 2014 BY JLT






# KALIUM 1052 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
3/1/1985	SPUD.
3/26/1985	DRILLING COMPLETED.
	13 3/8" SET AT 914'; 500 SX LITE + 200 SX COMMON 9 5/8" SET AT 5255'; 1ST STAGE: 500 SX LITE + 200 SX COMMON; 2ND STAGE: 825 SX LITE + 100 SX COMMON 7" SET AT 7787'; 940 SX POZ, 50 CIH WITH 5% KCL & 1% HALAD 322 PBTD @ 7850' WITH 70 SX CIH (8045'-7850')
3/27/1985	WELL COMPLETED.
9/25/1998	PLUGGING START DATE
7/28/1998	RECOVER 243' 7" CASING
7/29/1998	INSTALL BAKER PIP PACKER. CUT 7" CASING 1275' AND 706' TO RECOVER 7". NO RECOVERY
9/29/1998	CUT 7" CASING AT 478'. TRY TO REMOVE CASING - NO RECOVERY. RUN 6201 OF 2-7/8" CEMENT STRING. CIRCULATE HOLE CLEAN. RUN CEMENT PLUGS AND CAP OFF WELL. 6191'-6200' BAKER PIP 6200'-5933' 50 SX CLASS A 5933'-5063' 150 SX CLASS A WITH 6% BENTONITE 5063'-4193' 150 SX CLASS A WITH 6% BENTONITE 4193'-3323' 150 SX CLASS A WITH 6% BENTONITE 3323'-2433' 150 SX CLASS A WITH 6% BENTONITE 2433'-1583' 150 SX CLASS A WITH 6% BENTONITE 1583'-713' 150 SX CLASS A WITH 6% BENTONITE 713'-SURFACE 100 SX CLASS A CUT WELLHEAD OFF AND CAP CASING AT BOTTOM OF SUMP.

OCT 20 1998

Form Approved. OMB No. 2040-0042. Expires 6-30-98

RAY V.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460 EPA WELL REWORK RECORD						RECEIVED																																																								
NAME AND ADDRESS OF PERMITTEE IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639			OCT 20 1998 GEOLOGICAL SURVEY DIV. ENVIRONMENTAL QUALITY																																																								
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES		STATE MI	COUNTY Osceola	PERMIT NUMBER <u>379-655-767</u> MI-133-3G-A002																																																										
<div style="display: flex; justify-content: space-between;"> <span>N</span> <span>E</span> </div> <table border="1" style="margin: auto; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="display: flex; justify-content: space-between;"> <span>W</span> <span>S</span> </div>										X																																																<b>SURFACE LOCATION DESCRIPTION</b> <u>SW1/4 of NW1/4 of NW1/4 of</u> <u>1/4 of Section 26 Township 17N Range 9W</u> Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location <u>1169</u> ft. from (N/S) <u>N</u> Line of quarter section and <u>650</u> ft. from (E/W) <u>W</u> line of quarter section				
		X																																																												
<b>WELL ACTIVITY</b> <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework 8045  Total Depth After Rework 8045  Date Rework Commenced 9/25/98  Date Rework Completed 9/25/98		<b>TYPE OF PERMIT</b> <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area Number of Wells <u>17</u>  Well Number 1052																																																										
Lease Name Kalium Hersey																																																														
WELL CASING RECORD - BEFORE REWORK																																																														
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																								
Size	Depth	Sacks	Type	From	To																																																									
13 3/8	914	700	LITE/A																																																											
9 5/8	5255	1625	LITE/A																																																											
7	7745	1060	PREMIUM																																																											
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																														
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																								
Size	Depth	Sacks	Type	From	To																																																									
13 3/8	914	700	LITE/A																																																											
9 5/8	5255	1625	LITE/A																																																											
7	7745	1060	PREMIUM																																																											
Describe rework operations in detail Use additional sheets if necessary					Wire line logs, list each type																																																									
Run 7" casing cutter. Cut casing at 478'. Trip out. Run 7" spear. Could not remove casing stub. Trip spear laying. Run 2 7/8" cementing string to 6201. Circulate hole clean. Run cement plugs as per attached sheet. Cut wellhead off and cap casing at bottom of sump.					Log Types																																																									
					Logged intervals																																																									
CERTIFICATION																																																														
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).																																																														
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE 		DATE SIGNED 10/15/98																																																									

**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994, as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment.

- ☐ Part 615 Oil/Gas Well ☒ Plugging  
☒ Part 625 Mineral Well ☐ Change of Well

Permit number **MI-133-36-A002** Well name and number **Hersey 1052**  
Name and address of permittee  
**IMC Kalium, Ltd.**  
**1395 - 135th Avenue**  
**Hersey, MI 49639**

OCT 20 1998

Name and address of contractor/service company  
**Cementrite Inc. Mid-State Oil Tools**  
**P.O.Box 623 6828 Lea-Pick Dr.**  
**Mt. Pleasant, MI 48804-0623** **Mt. Pleasant, MI 48858**

Type of well **Mineral Well** Field name  
SW  $\frac{1}{4}$  NW  $\frac{1}{4}$  NW  $\frac{1}{4}$  Sec 26 T 17N R 9W  
Township **Hersey** County **Osceola**  
Date plugging/change started **09/25/98** Date plugging/change completed **09/25/98**

DEQ employee issuing plugging permit or approving Change of Well Status.

Date issued

Rick Henderson

Any change of well status which results in a change of production for a prorated well or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse.

**WELL PLUGGING**  
(Hole conditions after plugging)

## CASING

Casing size	Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled
13-3/8" - 48#/ft	914'	None	None
9-5/8" - 40#/ft	5255	None	None
7" - 23#/ft	7745	243'	Casingcuts at 1275'
			706', and 478'

## PLUGS

Depth of plug Bottom Top	Make and type of bridge or plug	Cement plugs: type, amount of cement & mix water	Additives, type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N
6191' 6200'	Baker PIP	6200'-5933' 50 sacks	Class A Cement		30min	N
		5933'-5063' 150sacks	Class A cement w/ 6%		30min	N
			Bentonite			
		5063'-4193' 150 sacks	" " " "	" " " "	30min	N
		4193'-3323' 150 sacks	" " " "	" " " "	30min	N
		3323'-2433' 150 sacks	" " " "	" " " "	30min	N
		2433'-1583' 150 sacks	" " " "	" " " "	30min	N
		1583'- 713' 150 sacks	" " " "	" " " "	30min	N
		713' - o' 100 sacks	Class A Cement			N

- ☐ Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse  
☐ Check if cores were taken and attach core descriptions

Mail completed original and three copies to the appropriate DEQ district office or to the Lansing office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well.

GEOLOGICAL SURVEY DIVISION  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

## CHANGE OF WELL STATUS

Change was to: <input type="checkbox"/> Convert current zone to: <input type="checkbox"/> Production <input type="checkbox"/> Disposal <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Storage <input type="checkbox"/> Other	<input type="checkbox"/> Remediate well: <input type="checkbox"/> Perf and test existing zone <input type="checkbox"/> Repair casing/cement <input type="checkbox"/> Other _____	<input type="checkbox"/> Plugback (recomplete as) <input type="checkbox"/> New production zone <input type="checkbox"/> Disposal <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Storage <input type="checkbox"/> Other	<input type="checkbox"/> Redrill: <input type="checkbox"/> Horizontal drain hole <input type="checkbox"/> Collapsed casing <input type="checkbox"/> Underream open hole <input type="checkbox"/> Other
---	---	---	--

### Well casing record - BEFORE change

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well casing record - AFTER change (Indicate additions and changes only, complete test record)

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

#### BEFORE CHANGE

Total depth	Completed Fm	Well completed for
BOPD	MCFGPD	Inj Rate      Pressure

#### AFTER CHANGE

Total depth	Completed Fm	Well completed for
BOPD	MCFGPD	Inj Rate      Pressure

#### DAILY PRODUCTION TEST RECORD

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure	
				Tubing	Casing

#### DAILY INJECTION TEST RECORD

Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
		Beginning	Ending	

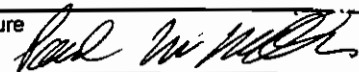
### DAILY CHRONOLOGY

Describe in detail the daily chronology of change/plugging, include days shut down. Describe exceptions to issued plugging instructions. Describe tools, tubing, etc. left in hole and any logs running. Include dates pits filled, surface restored etc. Use additional pages as needed.

Date	Narrative
07/28/98	Recover 243' 7" casing
07/29/98	Install Baker PIP Packer. Cut 7" casing 1275' and 706' to recover 7". (No recovery)
09/29/98	Cut 7" casing at 478'. Try to remove casing - no recovery Run 6201 of 2-7/8" cement string. Circulate hole clean. Run cement plugs and cap off well.

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended, a well owner has continuing liability for the integrity of a plugged well.


CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (printed or typed) Paul McMillen, Minefield Superintendent	Authorized signature 	Date 10/14/98
--	--	------------------

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.

Mail completed original and three copies to the DEQ District Office within 60 days after completion of plugging or change of an oil/gas well;  
or within 30 days after completion of a mineral well

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460							
<b>EPA</b>		<b>WELL REWORK RECORD</b>					
NAME AND ADDRESS OF PERMITTEE IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639				NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639			
LOCATE WELL AND OUTLINE UNIT ON <b>SECTION PLAT - 640 ACRES</b>		STATE MI		COUNTY Osceola		PERMIT NUMBER MI-133-3G-A002	
<div style="text-align: center;">N</div> <div style="text-align: center;">S</div>		SURFACE LOCATION DESCRIPTION SE1/4 of NW1/4 of SW1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1118 ft. from (N/S) N Line of quarter section and 1319 ft. from (E/W) W line of quarter section					
WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining Lease Name Kalium Hersey				Total Depth Before Rework 7800  Total Depth After Rework 7800  Date Rework Commenced 10/7/98  Date Rework Completed 10/8/98		TYPE OF PERMIT <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area Number of Wells 17  Well Number 2081	
<b>WELL CASING RECORD - BEFORE REWORK</b>							
Casing		Cement		Perforations		Acid or Fracture Treatment Record	
Size	Depth	Sacks	Type	From	To		
30	90	Driven					
13 3/8	908	825	A				
9 5/8	5134	1950	A				
7	7718	730	H				
<b>WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)</b>							
Casing		Cement		Perforations		Acid or Fracture Treatment Record	
Size	Depth	Sacks	Type	From	To		
30	90	Driven					
13 3/8	908	825	A				
9 5/8	5134	1950	A				
7	7718	730	H	7706	7704	4sh/ft	
Describe rework operations in detail Use additional sheets if necessary					Wire line logs, list each type		
Puli tubing. Perf 7702-7707. G/N/CCL - Land at 7720'					Log Types		Logged intervals
<b>CERTIFICATION</b>							
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).							
NAME AND OFFICIAL TITLE (Please type or print) Paul McMullen Minefield Supervisor				SIGNATURE 		DATE SIGNED 10/14/98	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY																																																														
WASHINGTON, DC 20460																																																														
EPA		WELL REWORK RECORD																																																												
<b>NAME AND ADDRESS OF PERMITTEE</b>				<b>NAME AND ADDRESS OF CONTRACTOR</b>																																																										
IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639				IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639																																																										
<b>LOCATE WELL AND OUTLINE UNIT ON</b>		<b>STATE</b>	<b>COUNTY</b>	<b>PERMIT NUMBER</b>																																																										
SECTION PLAT -- 640 ACRES		MI	Osceola	MI-133-3G-A002																																																										
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 100px; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: -20px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -20px; top: 50%; transform: translateY(-50%);">E</div>										X																																																<b>SURFACE LOCATION DESCRIPTION</b>				
		X																																																												
<u>SW1/4 of NW1/4 of NW1/4 of</u> 1/4 of Section <u>26</u> Township <u>17N</u> Range <u>9W</u>																																																														
Locate well in two directions from nearest lines of quarter section and drilling unit																																																														
Surface Location <u>1169</u> ft. from (N/S) <u>N</u> Line of quarter section and <u>650</u> ft. from (E/W) <u>W</u> line of quarter section																																																														
<b>WELL ACTIVITY</b>		<b>Total Depth Before Rework</b>		<b>TYPE OF PERMIT</b>																																																										
<input type="checkbox"/> Brine Disposal		8045		<input type="checkbox"/> Individual																																																										
<input type="checkbox"/> Enhanced Recovery		<b>Total Depth After Rework</b>		<input checked="" type="checkbox"/> Area																																																										
<input type="checkbox"/> Hydrocarbon Storage		8045		Number of Wells <u>18</u>																																																										
<input checked="" type="checkbox"/> Sol'n Mining		<b>Date Rework Commenced</b>		Well Number																																																										
Lease Name		6/16/98		1052																																																										
Kalium Hersey		<b>Date Rework Completed</b>																																																												
		7/29/98																																																												
<b>WELL CASING RECORD - BEFORE REWORK</b>																																																														
<b>Casing</b>		<b>Cement</b>		<b>Perforations</b>		<b>Acid or Fracture Treatment Record</b>																																																								
<b>Size</b>	<b>Depth</b>	<b>Sacks</b>	<b>Type</b>	<b>From</b>	<b>To</b>																																																									
13 3/8	914	700	LITE/A																																																											
9 5/8	5255	1625	LITE/A																																																											
7	7745	1060	PREMIUM																																																											
<b>WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)</b>																																																														
<b>Casing</b>		<b>Cement</b>		<b>Perforations</b>		<b>Acid or Fracture Treatment Record</b>																																																								
<b>Size</b>	<b>Depth</b>	<b>Sacks</b>	<b>Type</b>	<b>From</b>	<b>To</b>																																																									
13 3/8	914	700	LITE/A																																																											
9 5/8	5255	1625	LITE/A																																																											
7	7745	1060	PREMIUM																																																											
<b>Describe rework operations in detail</b>				<b>Wire line logs, list each type</b>																																																										
<b>Use additional sheets if necessary</b>				<b>Log Types</b>																																																										
Remove THL. Run flat bottom mill to 7820. Remove 7" casing to 243'. Set packer at 6200'.				<b>Logged intervals</b>																																																										
<b>CERTIFICATION</b>																																																														
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).																																																														
<b>NAME AND OFFICIAL TITLE (Please type or print)</b>				<b>SIGNATURE</b>		<b>DATE SIGNED</b>																																																								
Paul McMillen Minefield Supervisor						09/28/98																																																								

**STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT**

**TYPE OR PRINT**

**SUBMIT 4 COPIES TO:** Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

Filing for change of ownership of well is required in accordance with ☐ Act 31, P.A. 1939 and ☒ Act 315 P.A. 1969, as amended and Administrative Rules promulgated thereunder

PERMIT NO. <del>379</del> <del>810</del> -855-567	WELL TYPE Solution Mining
FIELD NAME	
WELL NAME AND NUMBER Kalium 1052 (formerly PPG 1052)	
WELL LOCATION SW $\frac{1}{4}$ NW $\frac{1}{4}$ SECTION 26 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

**TRANSFER OF A PERMIT FROM:**

NAME(S) OF SELLING OWNER(S)  
PPG Industries, Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One PPG Place, Pittsburgh. PA 15272

(412) 434-2841

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Industries, Inc., R.J. Samelson

*R.J. Samelson* 9/6/88

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

**TRANSFER OF A PERMIT TO:**

NAME(S) OF ACQUIRING OWNER(S)

Kalium Chemicals, Ltd.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

11126 140th Avenue, Hersey, MI 49639

(616) 832-3206

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling operation and abandonment in conformity with the law regulations and orders

SURETY BOND

☐

SINGLE WELL

☐

ATTACHED

BONDING CO

☒

BLANKET

☐

ON FILE

BOND NUMBER

*U/C Bank of Montreal*

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Kalium Chemicals, Ltd., Donald D. Metzger

*Donald D. Metzger* 9-19-88

**FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY**

APPROVED

*Stephen J. Szpytowski*  
Signature

*10/17/88*  
Date

DISTRIBUTION BY DNR

- ☐ Lansing
- ☐ Acquiring Owner
- ☐ Selling Owner
- ☐ Field

**STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT**

**TYPE OR PRINT**

**SUBMIT 4 COPIES TO:**

Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

Filing for change of ownership of well is required in accordance with ☐ Act 51, P.A. 1939 and ☒ Act 345 P.A. 1969, as amended, and Administrative Rules promulgated thereunder

PERMIT NO 010-851-367	WELL TYPE Mineral Exploration
FIELD NAME	
WELL NAME AND NUMBER Kalium 1052 (formerly PPG 1052)	
WELL LOCATION SW 1/4 NW 1/4 NW 1/4 SECTION 26 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

**TRANSFER OF A PERMIT FROM:**

NAME(S) OF SELLING OWNER(S)

PPG Industries, Inc.

ADDRESS Number and Street - City or Town - State - Zip Code - Telephone

One PPG Place, Pittsburgh, PA 15272

(412) 434-2841

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Industries, Inc., R.J. Samelson

*R.J. Samelson* 9/6/88

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

**TRANSFER OF A PERMIT TO:**

NAME(S) OF ACQUIRING OWNER(S)

Kalium Chemicals, Ltd.

ADDRESS Number and Street - City or Town - State - Zip Code - Telephone

11126 South 140th Avenue, Hersey, MI 49639

(616) 832-3206

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling operation and abandonment in conformity with the law regulations and orders

SURETY BOND

☐

SINGLE WELL

☐

ATTACHED

BONDING CO

*L/C Bank of Montreal*

☒

BLANKET

☐

ON FILE

BOND NUMBER

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Kalium Chemicals, Ltd., Donald D. Metzger

*Donald D. Metzger* 9-19-88

**FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY**

DISTRIBUTION BY DNR

☒ Lansing

☐ Acquiring Owner

☐ Selling Owner

☐ Field

APPROVED

*Stephen J. Szyszczanski*  
Signature

*10/17/88*  
Date



MINERAL WELL PERMIT  
For a Brine, Storage, or Waste Disposal Well

Permit Number <sup>379</sup>  
010-855-~~367~~ 7

Date Issued 9/9/85

Permission is hereby granted to PPG Industries, Inc.

(Name)

One PPG Place, Pittsburgh, PA 15272

(Address)

to convert & operate

solution mining

(Type of Operation)

(Type of Mineral Well)

to be located in SW¼, NW¼ NW¼ Section 26, T17N, R9W, Hersay Twp. Osceola County

WELL NAME	WELL NUMBER	FORMATION	INTENDED DEPTH
	1052	Niagaran	8000'
ELEVATION	RB _____	RF _____	RT _____
			GR _____

SPECIAL INSTRUCTIONS: Well is to be drilled in accordance with Supervisor of Wells Letter of Instruction #1-84. Same surface as Permit #010-851-367

Permit is subject to the provisions and requirements of Act 315, P.A. 1969, as amended, and rules, requirements, or orders issued by the Supervisor of Mineral Wells and the Department of Natural Resources.

SUPERVISOR OF MINERAL WELLS, BY:

*David H. Bechler* David H. Bechler  
Coordinator, Permits & Bonds Unit, P.O. Box 30028, Lansing MI 48909, 517-373-9290  
NOTICE

- 1 This permit is issued on the basis of the approved program outlined in the application. No change or alteration is to be made without the permission and approval of the Supervisor of Mineral Wells or his authorized representative.
- 2 This permit shall be posted in a conspicuous place at the well location and remain posted until the operation is completed.
- 3 This permit will expire 6 months from date of issuance if operation has not commenced or if the operator has not requested and received an extension of time.
- 4 An unusual, unexpected, or difficultly-controllable large volume of oil, gas, brine or flowing fresh water or a condition hazardous to public health, safety or waters of the state shall be reported immediately to the Supervisor.

THE FOLLOWING SHALL BE NOTIFIED AT LEAST 24 HOURS  
PRIOR TO THE COMMENCEMENT OF OPERATIONS:

Cadillac Field Office 616-775-9727

DISTRIBUTION:  
LINEN-APPLICANT  
2 - LANSING  
3 - FIELD  
4 - APPLICANT

DRILLING PERMIT APPLICATION FLOW SHEET

OPERATOR PPG Industries Inc

NUMBER MW-68-85

WELL NAME #1052

DATE RECEIVED AUG 29 1985

ACCEPTABLE Same surface as P# 010-851-367

FEE



☒ Check to cashier

~~C & T, tag enclosed~~

~~Deepening~~

Conversion to solution mining

BOND



Single well bond attached

☒ Blanket on file

Cash bond receipt

DRLG. UNIT



Special Order #1-73

General Rules

Field spacing order

Voluntary pooling agreement

Ready to issue

LOCATION



☒ Survey

Elevations

☒ Directional plans

~~Posted on map~~

CSG./SEAL



☒ Rotary

Cable

Comb.

Inter. css. (S.O. 2-73)

Exception

Thru Gas Storage

☒ BOP

SURF./MIN. OWN.



Private; landowner notified

State; lease # \_\_\_\_\_; restrictions \_\_\_\_\_

Lands Division approval

Federal; copy to MMS \_\_\_\_\_; copy to USFS \_\_\_\_\_; USFS approval

H<sub>2</sub>S REVIEW



Copy to H<sub>2</sub>S Unit

Contingency Plan

3 copies of H<sub>2</sub>S Committee

EIA REVIEW



District Cadillac

Region II

State Land NO

Special Order 1-81 addressed

~~Pit Liner exception request~~

P. & P./GEOL.



Confidential Request

Proration Unit

Allowable Letter:

Petr. Geol. Unit

Field Name:

MISC.



Public hearing pending

Records due

Other problems

REVIEWER DB 9/4/85

DATE:

MW-68-85

PRINT OR TYPE INFORMATION SEE INSTRUCTION SHEET R 7500-1 BEFORE FILLING OUT APPLICATION

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

APPLICATION FOR A MINERAL WELL PERMIT

To Drill, Operate, Convert, or Rework  
a Brine, Storage, Disposal, or Test Well.

By Authority of Act 315, P. A. 1969

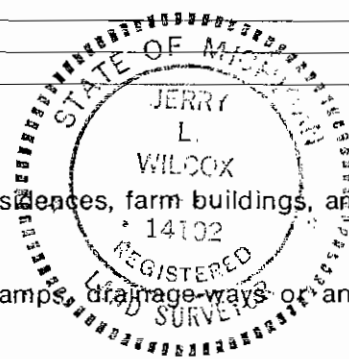
<p>1. DATE OF APPLICATION</p> <p>2. FEE ENCLOSED \$50.00</p>		<p>3. APPLICATION TO Convert to Mineral Well</p> <p>4. TYPE MINERAL WELL Solution Mining</p> <p>5. WELL DESIGNATION #1052</p>	
<p>6. LOCATION: SW1/4 of the NW 1/4 of the NW 1/4 SEC 26 T 17N R 9W</p> <p>7. TOWNSHIP Hersey</p>		<p>8. COUNTY Osceola</p>	
<p>9. APPLICANT PPG Industries, Inc.</p> <p>11. ADDRESS (Street, City, State) One PPG Place, Pittsburgh, PA</p>		<p>10. TELEPHONE (412)434-2841</p> <p>12. ZIP CODE 15272</p>	
<p>13. SURETY OR SECURITY COMPANY Hartford Accident &amp; Indemnity Co.</p> <p>17. OWNER OR SURFACE RIGHTS PPG Industries, Inc.</p>		<p>14. TYPE <input type="checkbox"/> SINGLE <input checked="" type="checkbox"/> BLANKET</p> <p>15. AMOUNT \$25,000</p> <p>16. BOND NO 4506230</p>	
<p>19. DRILLING CONTRACTOR</p>		<p>20. ADDRESS</p>	
<p>22. TYPE DRILLING TOOLS <input type="checkbox"/> CABLE <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> COMBINATION</p>		<p>23. FORMATION Niagaran</p>	
<p>25. PROJECT ENGINEER OR GEOLOGIST Donald D. Metzger</p>		<p>26. ADDRESS 2250 Enterprise Drive, Mt. Pleasant, MI 48858</p>	
<p>27. TELEPHONE (517)773-3949</p>		<p>28. PROGRAM OF DRILLING, CONVERTING, REWORKING, CASING, CEMENTING, COMPLETING, OPERATING, AND MONITORING. (See appropriate instruction sheet. Attach 3 copies of proposed program — including but not necessarily limited to information requested in the instruction sheet.)</p> <p>CASING PROGRAM: Size _____ Depth _____ Cement _____</p> <p>Attachments</p> <ul style="list-style-type: none"> <li>- Environmental Impact Assessment</li> <li>- Drilling Program</li> <li>- Completion Program</li> <li>- Operation</li> <li>- Monitoring</li> </ul>	
<p>THERE WILL BE NO CHANGES IN THE PROGRAM OUTLINED IN THIS APPLICATION WITHOUT APPROVAL OF THE SUPERVISOR OF MINERAL WELLS OR HIS AUTHORIZED REPRESENTATIVE.</p>			
<p>29. ADDRESS CORRESPONDENCE AND PERMIT TO: R. J. Samelson, PPG Industries, Inc. One PPG Place, Pittsburgh, PA 15272</p>		<p>30. TELEPHONE (412)434-2841</p>	
<p>MINERAL WELL SECTION USE ONLY</p> <p>STATUS OF BOND OK</p> <p>APPLICATION APPROVED BY David H. Bechler</p> <p>PERMIT NUMBER 319 810-855-867</p> <p>DATE ISSUED 9/9/85</p> <p>ISSUED BY David H. Bechler</p>		<p>The Applicant agrees to comply with provisions and requirements of Act 315, P.A. 1969, and asserts that the information on this application and attached report is true and correct.</p> <p>SIGNATURE (APPLICANT/AUTHORIZED REP) R. J. Samelson</p> <p>DATE 8/12/85</p> <p>NAME (TYPED) R. J. Samelson</p> <p>TITLE Manager, Environmental Programs</p>	
<p>DISTRIBUTION: White — Lansing Pink — Field Pink — Applicant</p> <p>397 50.00</p>		<p>FOR CASHIER'S USE ONLY</p> <p>R 7500 2/73</p>	

# **SURVEY RECORD OF WELL LOCATION**

(Submit five copies with Application for Permit to Drill a Well for Oil or Gas,  
Brine Disposal, Hydrocarbon Storage or Secondary Recovery)

85063

LESSEE (OWNER OF LEASE RIGHTS) <b>PPG INDUSTRIES, INC.</b>		WELL NO <b>1052</b>	
LESSOR (OWNER OF MINERAL RIGHTS) <b>PPG Industries, Inc.</b>		(PPG #1052)	
LOCATION			
SW ¼ OF	NW ¼ OF	¼ SECTION 26	T. 17 N R. 9 W
TOWNSHIP <b>Hersey</b>		COUNTY <b>Osceola</b>	
PLAT BELOW REPRESENTS ONE FULL SECTION (1 Mile Square)		<ol style="list-style-type: none"> <li>Outline drilling unit and spot well location on plat at left. Where drilling unit crosses section lines, divide the plat into an east half and a west half <b>OR</b> a north half and a south half (which ever applies). Outline the unit and locate the well in two directions from <b>NEAREST</b> quarter section and unit lines</li> <li>Location of well in two directions from <b>NEAREST</b> quarter section and unit lines is:  <div style="margin-left: 40px;"> <b>SURFACE LOCATION</b>  <u>1169</u> ft. from <u>North</u> line of Quarter Section  <small>(north-south)</small>  <u>650</u> ft from <u>West</u> line of Quarter Section  <small>(east-west)</small>    <u>      </u> ft from <u>      </u> line of unit  <small>(north-south)</small>  <u>      </u> ft from <u>      </u> line of unit  <small>(east-west)</small> </div> </li> <li>Describe wellsite marker. Show or describe access route if it is not readily accessible.  <u>Wellsite is marked with a cellar. Access is from the West off 140th Avenue. See supplemental plat.</u> </li> </ol>	
(Scale of Plat - 1 inch equals 1320 ft)			
<p><b>4 ON SEPARATE PLAT OR PLOT PLAN:</b></p> <p>A Locate identify, and show distances to all roads, power lines, residences, farm buildings, and other structures within 300 feet of the stake;</p> <p>B Locate, identify, and show distances to all lakes, streams, swamps, drainage ways or any other surface water features within 1320 feet of the stake</p> <p>5 In an ENVIRONMENTAL IMPACT ASSESSMENT describe all structures and surface features shown detailing plans for hazards prevention and erosion control (See instructions and guidelines for preparation of an environmental impact assessment)</p>			
NAME OF INDIVIDUAL WHO SURVEYED WELL SITE <i>Jerry L. Wilcox</i>		DATE <b>2-8-85</b>	TITLE <b>President</b>
ADDRESS <b>J. L. WILCOX &amp; ASSOCIATES, INC. 7230 North U.S.-131 Manton, Michigan 49663</b>			
I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF			
SIGNATURE (LESSEE OR AUTHORIZED REPRESENTATIVE) <i>D. R. L.</i>		ADDRESS (IF DIFFERENT THAN LESSEE)	DATE (MONTH, DAY, YEAR) <b>2/11/85</b>



N

1" = 660'

140 TH.

135 TH.

22

23

23

2 MILE

27

26

NORTH LINE SEC 26

26 RD

WEST LINE

1165'

SURFACE HOLE

650'

POLICK

SEC 26

375.9'

BOTTOM HOLE

331.54'

27

26

E-W 1/4

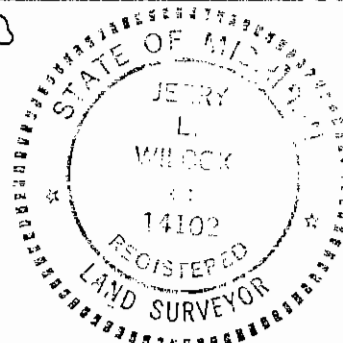
LINE

CREEK

AVE.

N-S 1/4 LINE

AVE.

REVISION ① ACTUAL  
DIMENSIONS 2/8

SUPPLEMENTAL PLAT: PPG # 1032  
SECTION 26, T17N-R21W,  
HERSEY TOWNSHIP, OSCEOLA  
COUNTY, MICHIGAN

CLIENT: PPG INDUSTRIES, INC.

DATE  
2-7-85  
DRN R.M.  
CHD EDW  
SCALE  
V. 1" = 660'

J.L. WILCOX & ASSOCIATES, INC.  
Engineers and Surveyors  
230 N. U.S. - 131 • Manton, Michigan 49663

NOTES SHEET JOB NO.  
B 1 OF 1 85063

STATE OF MICHIGAN  
MINERAL WELL OPERATORS  
ENVIRONMENTAL IMPACT ASSESSMENT

Well Identification

Name of Applicant: PPG Industries, Inc.  
Address: 2258 Enterprise Drive  
Mt. Pleasant, Michigan 48858  
\*Well Name and Number: PPG #1052  
Location: SW1/4 of NW1/4 of NW 1/4  
Section 26, T17N, R9W  
Hersey Twp., Osceola County, Michigan

I. Description of Project

The PPG #1052 well was directionally drilled from a surface location 1169 feet from the North line and 650 feet from the West line of the Northwest 1/4 of Section 26, T17N, R9W, to a bottom hole location 2296.46 feet from the North line and 375.9 feet from the West line of the same Northwest 1/4. The well was drilled to a total anticipated vertical depth of approximately 8000 feet. The surface and bottom hole are both located in the Northwest 1/4 of Section 26, T17N, R9W, Hersey Township, Osceola County, Michigan. This application is for a permit to convert Well #1052 from an exploratory well to a solution mining well. Surface and mineral rights for the entire Northwest 1/4 of Section 26 are owned in fee by PPG Industries, Inc. or under lease to PPG Industries, Inc.

This well is for the purpose of testing the solution mining technology for the production of potash bearing brines. This area has already been cleared and leveled for purposes of drilling exploratory mineral wells. The land surrounding the wellsite is rolling, open, dormant field. Land use in the surrounding area is mixed agricultural and forest recreational. Natural topography at the site had been a ridge and drainage is both Northwest and Northeast. The drainage to the Northwest is toward Polick Creek while that to the Northeast is toward Bull Hill Creek. Both creeks are over 1/4 mile away and are part of the Muskegon River watershed. There are no lakes, swamps or principal streams within 1/4 mile.

Access to the location will be from the West off 140th Avenue and utilizes the existing service road. One Hundred Fortieth Avenue is a gravel surfaced county road located along the West line of Section 26.

\*Permit to Drill No. 010-851-367

## II. Environmental Impact Assessment

The drilling of the wells at this location should have only a minor effect on the ecological system of the vicinity. Wildlife is abundant throughout the region, but no special or endangered species are known to exist in the vicinity of the proposed project. The proposed project should have only a slight effect on future population patterns.

The proposed project is intended for solution mining testing. Seven inch production casing will be set to the A-1 Evaporite and cemented back to surface.

No significant disruption to the environment will result since the drilling area is that previously cleared and paved for those wells which have already been drilled. A drilling pad area of approximately 1-1/4 acres has been prepared for drilling all the wells. Extensive tree removal was not necessary to clear the drilling pad. Because of the relatively large area included in the project, a slight amount of earthwork was needed to level the entire area. A Soil Erosion and Sedimentation Permit was acquired from Osceola County. Appropriate drillsite drainage and sedimentation control measures have been incorporated in the operational plan. Side slopes have been graded and are being seeded for stabilization. An asphalt pad has been laid in a 360' x 140' area around the drilled well and planned adjacent wells. This pad is sloped to provide drainage to the sealed cellar, which is routinely evacuated with a vacuum truck.

A mud pit system will not be required since this is an existing well and will also not be required for reworking/conversion purposes.

Access to the wellsite will be from the West off 140th Avenue and utilizes the existing service road. No new road will need to be constructed.

Since no hydrogen sulfide gas was encountered during the drilling, and since casing has been set, the possibility of encountering this material during rework/conversion operations can be ruled out.

Upon completion of solution mining operations, the well will be plugged in accordance with Michigan's Department of Natural Resource's instructions prior to abandonment. This project is expected to have only a slight effect on the immediate environment.

## III. Possible Alternative to the Proposed Well Location

The proposed bottom hole location has been selected on the basis of a geologic interpretation. The surface location has been chosen on the basis of an extensive on-site evaluation. By drilling this well from a common drilling pad with others, a minimum disruption of the environment will result. The proposed project area is well isolated from surface waters and human habitation. We believe the site is generally well suited for the undertaking of this project and that adequate protection of the environment can be maintained at this location. For these reasons, we believe that drilling the well from the surface location proposed is the best available alternative.

IV. Any Irreversible and Irretrievable Commitment of Resources

The proposed project should not require a significant commitment of natural resources. The productivity of the land utilized for the drilling pad and access road will be lost during the life of the project, but the surface resources of the drillsite will not be irreversibly committed. Drilling of the well will not curtail the use of the surrounding environment.

V. Summary

In order to minimize surface disturbances, this well has been directionally drilled from a common surface location which has been used for other wells in this 1/4 Section. The drilling pad area necessary for this project is approximately 1-1/4 acres. The drilling pad is located on rolling, generally open, dormant land. Land use in the surrounding area is mixed agricultural and forest recreational. Natural drainage from the locations is both Northeasterly and Northwesterly toward tributaries of the Muskegon River. There are no surface waters within 1/4 mile of the proposed wellsite. Appropriate drillsite drainage and sedimentation control measures have been included in the operational plan. We do not anticipate sour gas at this location. Access to the wellsite is from the West off 140th Avenue and utilizes the existing service road. We consider the environmental impact of this project to be minimal, and will make every effort to ensure protection and preservation of the environment during the course of our drilling and testing operations

Applicant's Representative



Comments by Department of Natural Resources Representative:

\_\_\_\_\_  
Authorized Representative



## Section 28    Solution Mining Well Program

### I.     Drilling Program

A. Well No. PPG No. 1052 was drilled as follows:

1. Fifty-two feet of conductor pipe was driven. This would allow for the landing of a 20" conductor should washout below the 24" conductor pipe occur while drilling through the glacial drift.
2. A 17-1/2" hole was drilled to a firm footing as determined by geologists from samples.
3. A 13-3/8" S.T.C. 54# buttress casing equipped with Texas pattern weld-on shoe was run. A float collar was set one joint, off bottom. The lower 5 joints of casing were strapped across the collars in two or three sectors. Top and bottom cement plugs were run with no centralizer. See attached Exhibit "A" for additional detail.
4. A cement basket was run approximately 50' below surface to make sure that the cement would circulate back to surface.
5. A 12-1/4" hole was drilled to 5256'. Directional drilling was employed as per the attached Exhibit "B". Exhibit "C" shows the bottom hole location relative to the surface location. Directional surveys were run as required. Geophysical logs were run from the base of the surface casing to the intermediate casing point. These logs include those which provide information on lithology, porosity, and fluid characteristics.

A 9-5/8" I.T.C. 40# N-80 grade pipe was landed with a guide shoe on bottom and float collar at the first joint above, and the bottom six joints were secured with Weld-A. A stage collar was set at approximately 3400' from surface. Centralizers were run. The lower joints of casing were roughened to provide a better cement bond. See Exhibit "D" for additional details.

Pressure tests were completed after the intermediate casing had been run and after the blowout preventor equipment was installed on the 9 5/8" casing. The tests were run before the cement plugs were drilled out. The BOPE system was pressure tested for leaks, using the rig pump, to a pressure of 500-800 psi.

6. A 8-1/2" hole was drilled from the base of the intermediate casing to 7817'. The drill pipe was removed from the hole and a complete pressure check of the blowout preventors and casing was run. The BOPE system was pressure checked to 5000 psig, the Hydril to 2500 psig and the Intermediate Casing to 80% of burst pressure. This was done as a precautionary measure in the event of encountering  $H_2S$  Gas in the A-2 and/or A-1 Carbonate. At this stage a full  $H_2S$  monitoring system was also installed on the rig.

Directional drilling was accomplished in accordance with Exhibits "B" and "C". Directional surveys were run as needed.

7. Drilling continued into the top of the A-1 Evaporite, at which time a core barrel was picked up. A 4" core was then cut through the salt and potash beds of interest. The hole was then reamed with an 8-1/2" bit and deepened to the top of the Niagaran formation. Bottom hole location was verified by running a gyro survey. Monitoring for gas continued to total depth.
8. The core was then processed by PPG laboratory personnel.

#### B. Drilling Fluid

Drilling through the glacial drift was accomplished with chlorinated fresh water mud in steel working pits with solids control equipment. The cuttings were discharged to the asphalt lined disposal area and the fluid hauled to a disposal well. The hole from the base of the surface casing to the Detroit River Salt, was drilled with fresh water using steel working pits. Mud system volume was maintained by fresh water makeup and solids content was controlled by solids removal equipment. The solids were discharged into the asphalt lined disposal area. The drilling fluid becomes saturated with NaCl while drilling through the salt sections. Saturated brine is then used to maintain mud system volume. Solids were removed by the solids control equipment and discharged into the asphalt lined disposal area. The 8-1/2" hole drilled from the base of the intermediate casing to the top of the A-2 Evaporite utilizes the brine-based mud system generated during drilling of the well to intermediate casing point. Saturated brine makeup was used. After encountering the A-2 Evaporite, the brine mud system was displaced from the hole into steel holding tanks and replaced by a polymix-NaCl saturated mud system which contains KCl. Mud system properties were maintained at low water loss, and at a desired viscosity, yield and weight. This mud system is used to drill to total depth. This mud system was then displaced back into steel holding tanks for use in drilling of another well. Excess fluid generated during drilling was disposed in a disposal well.

C. Safety Equipment

Attached as Exhibits "E" and "F" are the blowout control systems used for drilling to intermediate casing point and to total depth, respectively. Monitoring of H<sub>2</sub>S in the circulating drilling mud system is accomplished on a 24-hour basis by mud logging equipment. The additional H<sub>2</sub>S monitoring equipment, mentioned above, augments this system.

## II. Completion Program

### A. Casing and Tubing

<u>Hole</u>		<u>Casing</u>			
<u>Depth</u>	<u>Bit Dia.</u>	<u>O.D. Size</u>	<u>Wt./Ft.</u>	<u>Grade-Condition</u>	<u>Depth</u>
52'	Drive	24"	0.412"	Wall New	52'
52-914'	17-1/2"	13-3/8"	54.5#	Buttress New	914'
914-5256'	12-1/4"	9-5/8"	40.0#	N-80 New	5255'
5256-8045'	8-1/2"	7"	23.0#	N-80 New	7787'

### B. Down Hole Equipment

The 7" casing was run in an 8-1/2" hole and set to approximately 7787' as follows:

1. A guide shoe was used on bottom with a manual fill float collar located one joint above the shoe. The guide shoe and float collar were locked on with a Baker Lok.
2. The centralizer was run into the middle of the first joint. The centralizer was held in place with a stop ring. The float shoe was centralized. Additional centralizers were run into the hole at points of high angle.
3. A short or marker joint was installed approximately 5-6 joints off bottom.
4. The mud system in the hole was circulated when the pipe is on bottom.
5. The casing was reciprocated while circulating and cementing. Reciprocation is stopped just prior to bumping the top plug.
6. A bottom (red) wiper plug was run.

### C. Cement

The 7" casing was cemented as follows:

1. The well was plugged with cement up into the A-1 Salt to a point below where the 7" casing is to be landed.

2. Thirty barrels of fresh water were pumped ahead of the cement.
3. The cement volume, determined by calculating hole volume from the caliper log, required to bring the cement to surface was calculated. Single stage cementing was used, as recommended by the cementing company. Cementing was accomplished with:

940 sacks poz., salt saturated  
50 sacks Class H with 5% KCL, 1% HALAD 322

#### D. Geophysical Logging

In addition to the logs run at intermediate casing point, gamma ray, neutron and other lithology indicating logs are run from the base of the intermediate casing to the top of the Niagaran formation. Later, when the cement plugs are drilled out to below the zone of mineralization, a series of cased hole-logs will be run. A cement bond log and collar locator will be run from total depth to surface. The depth of the casing is checked using a collar locator log to locate the marker joint.

#### E. Tests

The pressure testing of the 7" casing to 80% of burst pressure will take place prior to the initial mining. This pressure exceeds 133% of operating pressure. A packer will run to the bottom and the pressure checked in the final stages before mining commences.

#### F. Mining Interval

Mining will be commenced in the salt a short distance above the bottom of the 7" casing. The exact depth depends on the depth at which the potash bed is encountered.

#### G. Well Area

The wellhead will be within a concrete trench sump which will gravity drain through a steel pipe to another sump within a building in which pumps and other equipment will be located. Accumulation of any leakage in this sump will be pumped back into the circulating solution mining fluid.

### III. Operation

#### A. Well Operation:

##### 1. Single Well Operation

- a) Well No. 1052 will be operated initially as a single well with annulus injection and tubing withdrawal. Oil will be used as an inert pad to provide roof control and will be added as required. The well will be operated as a single well until the mined out cavity is large enough to connect with Well No. 1051. The well will then be converted to multi-well operation.

##### 2. Multi-Well Operation

- a) After Well Nos. 1051 & 1052 are connected, the wells will be operated as two well gallery. Either well may be operated as an injection or withdrawal well in the multi-well mode. Oil will continue to be used as required to provide roof control.

#### B. Operating Parameters

1. Injection flow will vary according to the stage that the cavity is in and the plant production requirements. During single well operation the injection flow will average less than 50 gpm. In multi-well operation the gallery flowrate will average as low as 75 gpm during certain stages and as high as 390 gpm during other stages. The gallery well may operate as high as 500 gpm for a short period of time.
2. Withdrawal flow will be approximately 97% of injection. No losses are anticipated to the formation.
3. Injection temperature will range from 50°F to 175°F.
4. Injection pressure will depend on the injection flowrate and the density difference of the injection and withdrawal fluids. It is anticipated that the injection pressure will range between 900 and 1545 psig.
5. Specific gravity of the withdrawal fluid will range between 1.2 and 1.25.
6. Chemical composition of the withdrawal fluid will depend on the ore being dissolved and is anticipated to range from nearly pure water to an aqueous solution of sodium chloride (NaCl) and potassium chloride (KCl) containing up to 435 gpl combined dissolved NaCl and KCl.
7. The injected fluids will be pretreated to reduce the dissolved oxygen concentration to less than 10 ppb for corrosion control purposes. Catalyzed Sodium sulfite or other commercially available chemicals will be used to scavenge the oxygen.

#### IV. Monitoring

##### A. Operating Parameters

The injection flowrate to each well will be continuously monitored by a totalizing flowmeter. The withdrawal flow from all wells will be combined and monitored with a continuous, totalizing meter. The chemical analysis of injection fluids and the withdrawal fluid from each individual well will be used along with the flowrates to determine a material balance on each well or gallery well.

##### B. Well Integrity and Solutioning Process.

1. The well head and surface equipment will be visually monitored by operations.
2. The condition of the borehole, casing, and cement sheath will be determined by monitoring the pressure when the well is operating. If any loss of fluid (other than expansion of the cavity) is indicated from a comparison of the injection and withdrawal flowmeters, pressure and/or video testing of the casing will be performed to locate leaks.

##### C. Surface Changes.

A network of benchmark monuments is being installed for the purpose of monitoring surface changes in the solution mining area. Baseline vertical control will be established before any solution mining is performed. The network includes monuments within an area covering approximately 7.5 square miles in and around the solution mining area, as well as several monuments located outside the intended mining area, which serve as reference benchmarks. Annual surveys will be conducted during the solution mining operation to ascertain any elevation changes on the surface. Reports will be mailed to DNR every two years.

## Exhibit A

### Surface Casing (13-3/8" in 17-1/2" hole @ 914')

1. Use insert float and Texas Pattern Shoe and lock to shoe joint with thread lock.
2. No centralizers.
3. Circulate hole a minimum of one complete circulation.
4. Do not reciprocate casing.
5. Run bottom (red) wiper plug. Do not use if carrying L.C.M. in cement.
6. Pump 70 bbls. fresh water ahead of cement.
7. Cement with:
  - a. 500 sacks HOWCO Lite, 3% CaCl
  - b. 200 sacks Common A, 3% CaCl

EDNRP1/JG/bg



PPG INDUSTRIES INC.

PPG-1052

OSCEOLA COUNTY, MICHIGAN

VERTICAL SECTION 1 IN. = 1000 FT.

feet

1000  
H.D.P. @ 1755' H.D.  
BUILD 2- 6'/100'  
2000  
MAXIMUM ANGLE 12.40'  
AT 2000' H.D.  
2000' TVL. 71' DISP.

3000

4000

5000

6000

START 2- 6'/100' DROP  
AT 6000' H.D.  
6700' TVL. 1075' DISP.

1140'  
7000  
VERTICAL AT 7525' H.D.  
7425' TVL.  
1140'  
7100' H.D.  
7777' TVL.

8000

PPG INDUSTRIES INC.

PPG-1052

OSCEOLA COUNTY, MICHIGAN

PLAN VIEW  
1 IN. = 325 FT.

OBJECTIVE NO. 1:

1146' S12.27' W OF  
SURFACE LOCATION  
7523' M.D. 7400' TVD.  
1119' SOUTH 247' WEST

OBJECTIVE NO. 2:

1146' S12.27' W OF  
SURFACE LOCATION  
7900' M.D. 7777' TVD.  
1119' SOUTH 247' WEST

SUBMITTED BY:

TRIPLE G DIRECTIONAL DRILLING  
TRAVERSE CITY, MICHIGAN

feet

25' RADIUS TARGET

## Exhibit D

### Intermediate Casing (9-5/8" in 12-1/4" hole @ 5255')

1. Use float collar and guide shoe and lock to shoe joint with Halliburton Weld-A.
2. Run one centralizer 10' above guide shoe and four more at every other collar spacing.
3. Circulate hole a minimum of one complete circulation and until the drag stabilizes.
4. Reciprocate casing while circulating and cementing. Stop reciprocation just prior to bumping to plug.
5. Run bottom (red) wiper plug. Do not use if carrying L.C.M. in cement.
6. Pump 30 bbls. fresh water ahead of cement.
7. Cement with enough cement from caliper log to bring cement to surface on all intermediate casing strings.
8. Run top (black) wiper plug.
9. Displace with fresh water.

**MINERAL WELL COMPLETION REPORT**  
TO BE FILED WITH THE SUPERVISOR WITHIN 60 DAYS  
AFTER COMPLETION OF WELL (ACT 315, P.A. 1969)

SUBMIT IN  
TRIPLICATE

NAME OF OWNER OR OPERATOR PPG INDUSTRIES, INC.		ADDRESS OF OWNER OR OPERATOR 2258 Enterprise Drive Mt. Pleasant, MI 48858	
NAME OF DRILLING CONTRACTOR INDRIL, INC.		ADDRESS OF DRILLING CONTRACTOR 2111 Enterprise Drive Mt. Pleasant, MI 48858	
WELL NAME PPG	WELL NUMBER 1052	PERMIT NUMBER 010-851-367	
LOCATION SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$	SECTION 26	TWP. 17N	RANGE 9W
TOWNSHIP Hersey	COUNTY Osceola		
FOOTAGE 1169 Ft from North Line and 650 Ft from West Line of quarter section N or S E or W			
DATE DRILLING COMMENCED 03/01/85	DATE DRILLING COMPLETED 03/26/85	DATE WELL COMPLETED 03/27/85	TYPE OF WELL D-5 Test Well
FORMATION COMPLETED IN A-1 Evaporite	TOTAL DEPTH 8052 MD; 7850 PBTD	ELEVATION KB 1162.1	RB RT RF GN 1160.7 1145.6
ROTARY TOOLS From 0 Feet to 8052 Feet		CABLE TOOLS From Feet to Feet	

**WELL CASING RECORD**

TUBING AND CASING DATA				CEMENTING DATA			PERFORATIONS OR OPEN HOLE		
SIZE	LB./FT.	GRADE	DEPTH	SACKS	TYPE	STAGING DEPTH(S)	NO. HOLES	FROM	TO
13-3/8	54.5#	K-55	914'	500 Lite,	200 Common				
9-5/8	40#	N-80	5255'	1st stage	500 Lite, 200 Common				
				2nd stage	825 Lite, 100 Common (LV Tool 3700')				
7"	26#	N-80	7787'	940 POZ,	50 Cl H, with 5% KCL & 1% Halad	322			
* PBTD 7850' with 70 ex Cl H, 8045-7850'									

**WATER ZONES**

**WIRE LINE LOGS RUN**

FORMATION	FROM	TO	AMOUNT	SERVICE COMPANY	TYPE LOG	INTERVAL LOGGED	COPY TO SURVEY
(Fresh)				Schlumberger	LDT/CNL/GR	100-8042	Yes
				"	DLL/MLL	3300-4250	Yes

**FRACTURE OR ACID TREATMENT**

**SOLUTION MINING**

DATE	FROM	TO	QUANTITY	NAME AND NUMBER OF INJECTION AND TARGET WELL - DISTANCE APART

The information in and attached to this report is complete and correct

SIGNATURE

TITLE

DATE

Geologist

4/19/85

GIVE COMPLETE FORMATION RECORD ON REVERSE SIDE

# FORMATION RECORD

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

ELEVATION USED: <input type="checkbox"/> KB <input type="checkbox"/> RT <input type="checkbox"/> RF <input type="checkbox"/> GR	GEOLOGIST NAME:	TOPS TAKEN FROM: <input type="checkbox"/> SAMPLE LOG <input type="checkbox"/> ELECTRIC LOG
--	-----------------	---

FROM	TO	FORMATION (TYPE, COLOR, ETC.)	FROM	TO	FORMATION (TYPE, COLOR, ETC.)

IF WELL WAS CORED ATTACH CORE DESCRIPTION AND ANALYSIS

LIST ATTACHMENTS:

GEOLOGICAL SURVEY USE ONLY	
REVIEWED BY	
DATE OF COMPLETION	

PPG INDUSTRIES, INC.  
PPG #1052  
SW $\frac{1}{4}$  NW $\frac{1}{4}$  NW $\frac{1}{4}$ , Section 26, T17N R9W  
Hersey Twp., Osceola Co., MI

(ALL TOPS SCHLUMBERGER)

Base of Drift @ 628

- 628 - 832 Shale, gray to red, gummy; with sandstone, light gray, subround; coal, blocky, firm, slightly vitreous.
- 832 - 909 Sandstone, light gray, buff, fine grained, rounded to subrounded, poorly cemented.
- 909 - 1020 Shale, medium to dark gray, blocky, firm.
- 1020 - 1390 Sandstone, light gray, subangular, moderately well cemented; with shale, medium gray, firm; trace limestone.

Triple Gyp @ 1390

- 1390 - 1462 Anhydrite, white, firm; with shale, medium to dark gray, firm.

Brown Lime @ 1462

- 1462 - 1582 Limestone, medium to dark brown, very finely crystalline, slightly sucrosic; with shale, medium to dark gray.

Stray Sandstone @ 1582

- 1582 - 1710 Sandstone, white, very finely crystalline, subangular, calcareous cement, becoming red.

Marshall @ 1710

- 1710 - 1850 Sandstone, white to transparent, very fine grained, subangular to subround, moderately well cemented; with shale, medium gray to dark gray, firm, non-calcareous.

Coldwater Shale @ 1850

- 1850 - 2582 Shale, gray to gray-blue, firm, slightly calcareous.

Sunbury @ 2582

- 2582 - 2676 Shale, very dark brown to black, trace pyrite, trace spore cases, firm.

PPG INDUSTRIES, INC.  
PPG #1052  
SW<sup>1</sup>/<sub>4</sub> NW<sup>1</sup>/<sub>4</sub> NW<sup>1</sup>/<sub>4</sub>, Section 26, T17N R9W  
Hersey Twp., Osceola Co., MI

Page 2

Ellsworth @ 2676

2676 - 3087 Shale, dark to medium gray to gray-green, soft to firm.

Antrim @ 3087 (Began kick @ 3080')

3087 - 3256 Shale, dark brown to black, firm, very slightly calcareous, very organic.

Traverse Formation @ 3256

3256 - 3304 Shale, dark gray to brownish-black, firm, pyritic; interbedded with limestone, brown to tan, very finely crystalline.

Traverse Limestone @ 3304

3304 - 3878 Limestone, creme to tan, brown to dark brown toward base, very fine to finely crystalline, compact, trace intercrystalline porosity, no fluorescence or stain, argillaceous toward base.

Bell Shale @ 3878 MD, 3832 TVD

3878 - 3942 Shale, gray, light gray, soft, non-calcareous.

Dundee @ 3942 MD, 3883 TVD

3942 - 4008 Limestone, light to medium brown, tan, microcrystalline, tight, compact, argillaceous, no visible porosity.

4008 - 4022 Dolomite, medium brown, some light brown to buff, finely to very finely crystalline, slightly argillaceous, trace stain, no fluorescence or cut, 5-7% porosity average.

Reed City Anhydrite @ 4022 MD, 3959 TVD

4022 - 4031 Anhydrite, white, firm.

Reed City Dolomite @ 4031 MD, 3968 TVD

4031 - 4064 Dolomite, tan to light brown to medium brown, very finely crystalline, trace sucrosic texture, 7-11% porosity, very slightly argillaceous, no fluorescence, stain or cut.

4064 - 4098 Dolomite, medium to light brown, trace dark brown 7-9%+ porosity, lighter portion very clean, no fluorescence or cut, good sucrosic porosity.

PPG INDUSTRIES, INC.  
PPG #1052  
SW $\frac{1}{4}$  NW $\frac{1}{4}$  NW $\frac{1}{4}$ , Section 26, T17N R9W  
Hersey Twp., Osceola Co., MI

Page 3

- 4098 - 4212 Dolomite, medium brown, trace light brown, carbonaceous stain, 6% porosity, very finely crystalline, slight trace sucrosic texture, argillaceous.  
Detroit River Anhydrite @ 4212 MD, 4129 TVD
- 4212 - 4280 Anhydrite, white, firm.  
Detroit River Salt @ 4280 MD, 4190 TVD
- 4280 - 4741 Salt, with dolomite, light brown to brown, very fine to finely crystalline, argillaceous, very compact; with anhydrite.  
Sour Zone @ 4741 MD, 4603 TVD
- 4741 - 4881 Dolomite, light to medium brown, tan, very finely crystalline to microcrystalline, compact, 3-6% intercrystalline porosity.  
Massive Anhydrite @ 4881 MD, 4730 TVD
- 4881 - 5141 Anhydrite, white, firm; dolomite, tan to brown, microcrystalline, trace stain and fluorescence, no cut.  
Base Anhydrite @ 5141 MD, 4965 TVD
- 5141 - 5214 Dolomite, light to medium brown, trace gray, very finely crystalline to microcrystalline, tight, no stain or fluorescence.  
Black Limestone @ 5214 MD, 5031 TVD
- 5214 - 5342 Limestone, dark brown to black to tan to buff, finely crystalline, trace intercrystalline porosity, argillaceous, wackstone, no stain or fluorescence.  
Sylvania @ 5342 MD, 5146 TVD
- 5342 - 5463 Sandstone, light brown to buff, fine grained, well cemented, subround, calcareous cement; with abundant limestone, tan to brown.  
Bois Blanc @ 5463 MD, 5258 TVD
- 5463 - 5621 Limestone, tan to gray-brown, very fine to finely crystalline, good porosity in part; with dolomite, dark gray to gray, microcrystalline; trace chert.



PPG INDUSTRIES, INC.  
PPG #1052  
SW $\frac{1}{4}$  NW $\frac{1}{4}$  NW $\frac{1}{4}$ , Section 26, T17N R9W  
Hersey Twp., Osceola Co., MI

Page 4

Bass Islands @ 5621 MD, 5408 TVD

5621 - 5926 Dolomite, gray-brown to light brown, no stain or fluorescence; trace anhydrite, white.

Salina @ 5926 MD, 5707 TVD

5926 - 5935 Dolomite, gray-brown to dark brown, microcrystalline, compact, argillaceous.

F Unit @ 5935 MD, 5716 TVD

5935 - 5978 Dolomite, dark brown, gray, very finely crystalline, compact, argillaceous.

F Salt @ 5978 MD, 5758 TVD

5978 - 6540 Salt, with shale, gray, soft.

E Unit @ 6540 MD, 6317 TVD

6540 - 6660 Shale, medium gray, calcareous, firm, trace intercrystalline porosity, moderately argillaceous; with dolomite, gray-brown.

D Salt @ 6660 MD, 6436 TVD

6660 - 6702 Salt.

C Shale @ 6702 MD, 6477 TVD

6702 - 6794 Shale, light to medium gray, trace red; dolomite, light to medium brown to red-brown, very finely to microcrystalline.

B Salt @ 6794 MD, 6569 TVD

6794 - 7168 Salt, massive.

A-2 Carbonate @ 7168 MD, 6940 TVD

7168 - 7304 Limestone, medium to light brown to gray-brown to dark brown, microcrystalline, tight, argillaceous; with dolomite, medium to light brown, very finely to microcrystalline.

A-2 Evaporite @ 7304 MD, 7076 TVD

7304 - 7662 Salt, massive.

PPG INDUSTRIES, INC.  
PPG #1052  
SW $\frac{1}{4}$  NW $\frac{1}{4}$  NW $\frac{1}{4}$ , Section 26, T17N R9W  
Hersey Twp., Osceola Co., MI

Page 5

A-1 Carbonate @ 7662 MD, 7435 TVD

7662 - 7717 Dolomite, dark to very dark brown, very finely to microcrystalline, argillaceous, tight; limestone, medium to dark brown.

A-1 Evaporite @ 7717 MD, 7490 TVD

7717 - 8037 Salt, massive; no anhydrite.

Niagaran @ 8037 MD, 7810 TVD

8037 - 8052 Limestone, medium to dark brown, medium gray, very finely to microcrystalline, argillaceous, tight, dense, no stain or fluorescence; trace of microlaminations.

Nº 11428

**MINERAL WELL PERMIT**  
For a Test Well(s)

Permit No.	010-851-367	
Date Issued	2-25-85	Date Expires 8-25-85

Permission is hereby granted to PPG Industries, Inc.  
2258 Enterprise Dr., Mt. Pleasant, MI  
(name)  
(address)

to drill Mineral Exploration  
(type of operation) [type of test well(s)]  
to be located in S1/4, N1/4, N1/4, Section 26, T17N, R9W, Hersey Township, Osceola County  
RB RF  
ppg 1052 Niagaran 8,000'  
(well name) (well number) (formation) (intended depth) RT GN  
(elevation)

SPECIAL INSTRUCTIONS: 1. "NOTICE AND REQUIREMENTS FOR SOURCES OF WATER AND WATER WELLS USED IN CONJUNCTION WITH OIL AND GAS OR MINERAL WELL DRILLING, AND OPERATIONS", December 1, 1984 is made part of and a condition of this permit. 2) Well is to be drilled in accordance with Supervisor of Wells Letter of Instruction 1 84. 3) Shall use asphalt pit with 20 mil PVC underliner.

Permit is subject to the provisions and requirements of Act 315 PA 1969, As Amended, and rules, requirements, or orders issued by the Supervisor of Mineral Wells and the Department of Natural Resources

SUPERVISOR OF MINERAL WELLS

By: David H. Bechler David H. Bechler  
Title: Coordinator, Regulatory Control Unit  
Address: PO Box 30028  
Lansing, MI 48909

Please address all notifications, correspondence, and records to:

Notification of Start:

Cadillac Field Office 616-775-9727

Telephone: 517-373-9290

— NOTICE —

1. This permit is issued on the basis of the approved program outlined in the application. No changes or alterations are to be made without the permission and approval of the Supervisor of Mineral Wells or his authorized representative.
2. This permit, or a copy thereof, shall be posted at a conspicuous place at the well location or be in the possession of the driller.
3. It is further made a requirement of this permit that the applicant (or contractor) give notice to the public utilities in accordance with Act 53, Public Acts of 1974, Compiled Laws 460.701 to 460.718 and comply with each of the requirements of the act.
4. An unusual, unexpected, or difficultly controllable large volume of oil, gas, brine or flowing fresh water or a condition hazardous to public health, safety, or waters of the state shall be reported immediately to the Supervisor.

Distribution: Linen-applicant—2-Lansing—3-field—4-applicant.

FEB 12 1985

MW-2-PS

PRINT OR TYPE INFORMATION. SEE INSTRUCTION SHEET R 7500-1 BEFORE FILLING OUT APPLICATION

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

## APPLICATION FOR A MINERAL WELL PERMIT

To Drill, Operate, Convert, or Rework  
a Brine, Storage, Disposal, or Test Well.

By Authority of Act 315, P. A. 1969

1 DATE OF APPLICATION 2-11-85	2 FEE ENCLOSED \$1.00
3 APPLICATION TO Drill	
4. TYPE MINERAL WELL D-5 (Test Well)	5. WELL DESIGNATION PPG 1052
6 LOCATION: SW/4 of the NW/4 of the NW 1/4 SEC 26 T 17N R 9W	
7. TOWNSHIP Hersey	8. COUNTY Osceola

9. APPLICANT PPG Industries, Inc., 2258 Enterprise Drive, Mt. Pleasant, Michigan		10 TELEPHONE 517/773-3949
11 ADDRESS (Street City State) 2253 Enterprise Drive, Mt. Pleasant, Michigan		12 ZIP CODE 48858
13 SURETY OR SECURITY COMPANY Hartford Accident & Indemnity Co.	14. TYPE <input type="checkbox"/> SINGLE <input checked="" type="checkbox"/> BLANKET	15 AMOUNT \$25,000.00
17 OWNER OR SURFACE RIGHTS Willmet, Inc.	16 BOND NO 4512254	
19 DRILLING CONTRACTOR INDRIL, Inc.	20 ADDRESS P.O. Box 642, Mt. Pleasant, MI 48858	
22 TYPE DRILLING TOOLS <input type="checkbox"/> CABLE <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> COMBINATION	23 FORMATION Niagaran	21 TELEPHONE 517/773-6946
25 PROJECT ENGINEER OR GEOLOGIST D. D. Metzger	26 ADDRESS 2258 Enterprise Drive, Mt. Pleasant, MI 48858	24 INTENDED DEPTH 8,000'
27 TELEPHONE 517/773-3949		

28 PROGRAM OF DRILLING CONVERTING REWORKING, CASING, CEMENTING, COMPLETING OPERATING AND MONITORING.  
(See appropriate instruction sheet. Attach 3 copies of proposed program — including but not necessarily limited to information requested in the instruction sheet.)

CASING PROGRAM:  
Size Depth Cement

INSTRUCTION SHEET NO.		
Type of Well	Drill-New	Rework*
Brine	D-1	R-1
Storage	D-2	R-1
Disposal	D-3	R-1
Solution Mining	D-4	R-2
Test Well	D-5 X	R-1

\*Rework, Deepen, or Convert to New Use

Exhibits 1, 2, &amp; 3 Enclosed

THERE WILL BE NO CHANGES IN THE PROGRAM OUTLINED IN THIS APPLICATION WITHOUT APPROVAL OF  
THE SUPERVISOR OF MINERAL WELLS OR HIS AUTHORIZED REPRESENTATIVE.

29 ADDRESS CORRESPONDENCE AND PERMIT TO: PPG Industries, Inc., 2258 Enterprise Dr., Mt. Pleasant, MI 48858	30. TELEPHONE 517/773-3949
---	-------------------------------

## MINERAL WELL SECTION USE ONLY

STATUS OF BOND

APPLICATION APPROVED BY

PERMIT NUMBER

DATE ISSUED

ISSUED BY

DISTRIBUTION:  
White — Lansing  
Canary — Field  
Pink — Applicant

The Applicant agrees to comply with provisions and requirements  
of Act 315, P.A. 1969, and asserts that the information on this  
application and attached report is true and correct.

SIGNATURE (APPLICANT/AUTHORIZED REP)

DATE

NAME (TYPED)

TITLE

FOR CASHIER'S USE ONLY

R 7500 2/73

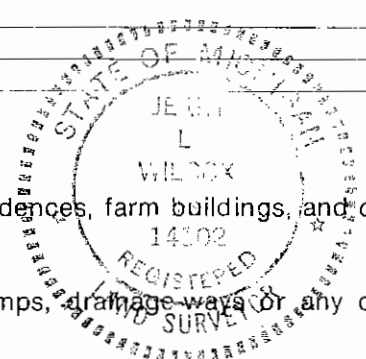
STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

# **SURVEY RECORD OF WELL LOCATION**

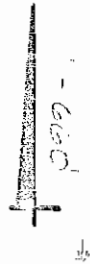
(Submit five copies with Application for Permit to Drill a Well for Oil or Gas,  
Brine Disposal, Hydrocarbon Storage or Secondary Recovery)

85063

LESSEE (OWNER OF LEASE RIGHTS)				PPG INDUSTRIES, INC.			
LESSOR (OWNER OF MINERAL RIGHTS)				PPG Industries, Inc.		(PPG #1052)	
WELL NO				1052			
LOCATION							
SW ¼ OF		NW ¼ OF		T. 17 N		R. 9 W	
TOWNSHIP				COUNTY			
Hersey				Osceola			
PLAT BELOW REPRESENTS ONE FULL SECTION (1 Mile Square)				<p>1 Outline drilling unit and spot well location on plat at left. Where drilling unit crosses section lines, divide the plat into an east half and a west half <b>OR</b> a north half and a south half (which ever applies) Outline the unit and locate the well in two directions from <b>NEAREST</b> quarter section and unit lines.</p> <p>2 Location of well in two directions from <b>NEAREST</b> quarter section and unit lines is:</p> <p style="text-align: center;">SURFACE LOCATION</p> <p><u>1169</u> ft from <u>North</u> line of Quarter Section <small>(north-south)</small></p> <p><u>650</u> ft from <u>West</u> line of Quarter Section <small>(east-west)</small></p> <p>_____ ft from _____ line of unit <small>(north-south)</small></p> <p>_____ ft from _____ line of unit <small>(east-west)</small></p> <p>3 Describe wellsite marker Show or describe access route if it is not readily accessible.</p> <p><u>Wellsite is marked with a cellar. Access is from the West off 140th Avenue. See supplemental plat.</u></p>			
SECTION 26							
(Scale of Plat — 1 inch equals 1320 ft.)							
<p>4 ON SEPARATE PLAT OR PLOT PLAN:</p> <p>A Locate, identify, and show distances to all roads, power lines, residences, farm buildings, and other structures within 300 feet of the stake;</p> <p>B. Locate, identify, and show distances to all lakes, streams, swamps, drainage ways or any other surface water features within 1320 feet of the stake.</p> <p>5 In an ENVIRONMENTAL IMPACT ASSESSMENT describe all structures and surface features shown detailing plans for hazards prevention and erosion control (See instructions and guidelines for preparation of an environmental impact assessment).</p>							
NAME OF INDIVIDUAL WHO SURVEYED WELL SITE				DATE		TITLE	
				Jerry L. Wilcox, LS#14102		2-8-85 President	
ADDRESS							
J. L. WILCOX & ASSOCIATES, INC. 7230 North U.S.-131 Manton, Michigan 49663							
I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF							
SIGNATURE (LESSEE OR AUTHORIZED REPRESENTATIVE)				ADDRESS (IF DIFFERENT THAN LESSEE)		DATE (MONTH DAY YEAR)	
						2/11/85	



N



140 TH.

130 TH.

22

23

23

2 MILE

27

26

NORTH LINE SEC 26

26 RD

1160'

650'

SURFACE HOLE

403'

BOTTOM HOLE

27

26

E-W 1/4

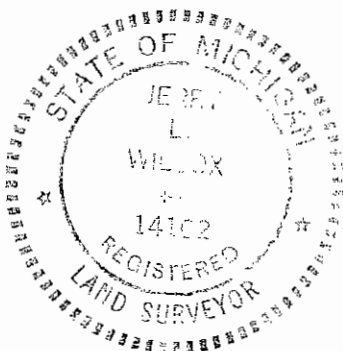
LINE

UNION

AVE.

N-S 1/4 LINE

AVE.



SUPPLEMENTAL PLAT: PPA 10 32  
SECTION 26, T17N-R21W,  
HERSEY TOWNSHIP, OSCEOLA  
COUNTY, MICHIGAN

CLIENT: PPA INDUSTRIES, INC.

DATE  
2-7-85  
DRN  
R.M.  
CHD  
EDW  
SCALE  
1"=660'

J.L. WILCOX & ASSOCIATES, INC.  
Engineers and Surveyors  
7230 N. U.S. - 131 • Manton Michigan 49663

NOTES  
SHEET  
1 OF 1  
JOB NO  
85002



PPG Industries, Inc. 2258 Enterprise Drive Mt. Pleasant, Michigan 48858 (517) 773-3949

February 11, 1985

Mr. Al Rarick  
Department of Natural Resources  
Geological Survey Division  
P. O. Box 30028  
Lansing, MI 48909

Dear Mr. Rarick:

Re: PPG Industries, Inc. Standard Casing and Cementing  
Procedures

Listed below are PPG Industries, Inc. standard casing and cementing  
procedures:

1. Drive 24" pipe as deep as possible. This allows us to set 20" conductor inside if trouble occurs with washout under conductor pipe while drilling surface hole.
2. Drill 17 1/2" hole to to at least 100' into bedrock or to a firm footing as determined by geologist from samples.
3. Run 13 3/8" S.T.C. 48# Seamless H-40 casing equipped with Texas pattern weld on shoe. A float collar is set 30', or one joint, off bottom. The lower 5 joints of casing are strapped across collar in either two or three sectors. Top and bottom cement plugs with no centralizer as recommended by cementing company (see attached).
4. We then drill 12 1/4" hole into Bass Islands formation or the Amherstburg if local drilling shows no lost circulation zones and set 9-5/8" L.T.C. 40# N-80 and K-55 grade pipe as follows: 1,000' of N-80 on bottom; 4,000' of K-55 above N-80 with 300'-500' of N-80 @ surface. Intermediate string contains a stage collar at approximately 3,800'. This string is run with a guide shoe on bottom with float collar first joint up and all bottom 6 joints secured with Weld-A or Baker Lok or some similar material and/or strapped as described in #3 above.
5. Centralizers are run per cementer's recommendation attached.
6. For both the surface and intermediate casings, the lower joints of casing are roughened unless they appear rusty as this provides a much better bond for cement.

Sincerely,

A handwritten signature in cursive script that reads "Donald P. Smith". The signature is written in dark ink and includes a small flourish at the end.

Donald P. Smith  
Exploration Engineer

DPS/blb  
Attachment

Exhibit #1

PPG INDUSTRIES INC.

PPG-1052

OSCEOLA COUNTY, MICHIGAN

PLAN VIEW  
1 IN. = 3000 FT.

OBJECTIVE NO. 1:

1146' S12.27'W OF

SURFACE LOCATION

7523' M.D. 7400' TVD.

1119' SOUTH 247' WEST

OBJECTIVE NO. 2:

1146' S12.27'W OF

SURFACE LOCATION

7900' M.D. 7777' TVD.

1119' SOUTH 247' WEST

SUBMITTED BY:

TRIPLE G DIRECTIONAL DRILLING  
TRAVERSE CITY, MICHIGAN

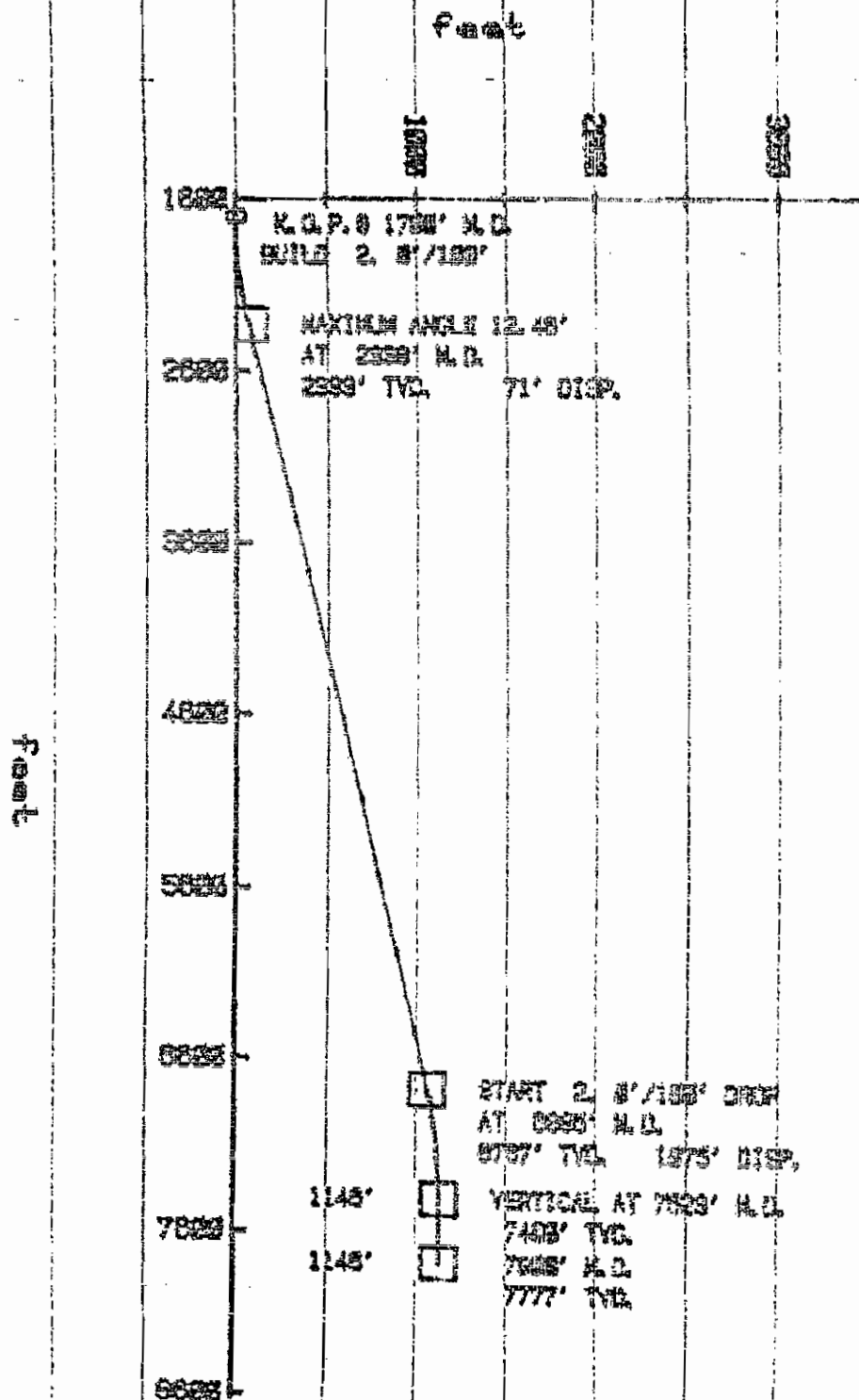
feet

25' RADIUS TARGET



PPG INDUSTRIES INC.  
PPG-1052  
OSCEOLA COUNTY, MICHIGAN

VERTICAL SECTION 1 IN. = 1000 FT.



STATE OF MICHIGAN  
MINERAL WELL OPERATORS  
ENVIRONMENTAL IMPACT ASSESSMENT

Well Identification

Name of Applicant: PPG Industries, Inc.  
Address: 2258 Enterprise Drive  
Mt. Pleasant, Michigan 48858  
Well Name and Number: PPG #1052  
Location: SW 1/4 of NW 1/4 of NW 1/4  
Section 26, T 17 N, R 9 W  
Hersey Twp., Osceola Co., MI

1. Description of Project:

An exploratory test is to be directionally drilled from a surface location 1169 feet from the North line and 650 feet from the West line of the Northwest 1/4 of Section 26, T17N, R9W, to a bottom hole location 2288 feet from the North line and 403 feet from the West line of the same Northwest 1/4. The well will be drilled to a total anticipated vertical depth of 8000 feet for the evaluation of sodium and potassium mineralization through the Niagaran Formation at this location. At the present time this project is intended for testing purposes only. A decision regarding production will be made based on an evaluation of this and other tests. The surface and bottom hole are both located in the Northwest 1/4 of Section 26, T17N, R9W, Hersey Township, Osceola County, Michigan. Surface and mineral rights for the entire Northwest 1/4 of Section 26 are in private ownership and all concerned parties have been informed of the proposed well location and advised of our intentions to complete an application for a permit to drill this mineral well.

The proposed well is part of a project involving several other wells. All wells will be drilled from a common drilling pad area. The area has already been cleared and leveled to prepare for drilling the previous wells. The land surrounding the wellsite is rolling, open, dormant field. Land use in the surrounding area is mixed agricultural and forest recreational. Natural topography at the site had been a ridge and drainage is both Northwest and Northeast. The drainage to the Northwest is toward Polick Creek while that to the Northeast is toward Bull Hill Creek. Both creeks are over 1/4 mile away and are part of the Muskegon River watershed. There are no lakes, swamps or principal streams within 1/4 mile.

Access to the location will be from the West off 140th Avenue and will utilize the existing service road. One Hundred Fortieth Avenue is a gravel surfaced county road located along the West line of Section 26.

## II. Environmental Impact Assessment:

The drilling of the test at this location should have only a minor effect on the ecological system of the vicinity. Wildlife is abundant throughout the region, but no special or endangered species are known to exist in the vicinity of the proposed project. The proposed project should have only a slight effect on future population patterns.

The proposed project is intended for exploratory investigations but may be converted for solution mining testing purposes. If converted to a test solution mining well, 7 inch casing would be set to the A-1 evaporite and cemented back to surface.

A minimal disruption to the environment will result by concentrating this well in the same areas as those which have already been drilled. A total area of approximately 7 1/4 acres has been prepared for drilling all the test wells. Extensive tree removal is not necessary to clear the drilling pad. Because of the relatively large area included in the project a slight amount of earthwork was needed to level the entire area. Appropriate drillsite drainage and sedimentation control measures have been incorporated in the operational plan. These will include utilization of earthen dikes along the fill portion of the drilling pad perimeter, stabilization of slopes as needed, location of reserve pits in the cut portion of the drilling pad and utilization of a collection-infiltration basin near the Northeastern corner. We have not experienced any unusual erosional problems at this location.

PPG's plans for handling drilling cuttings and fluids are as follows:

1. PPG contoured the sand placed on the naturally occurring clay surface immediately east of the drilling pad to form a containment area.
2. A 20-mil PVC membrane was placed in the containment area. The dimensions of the PVC membrane are 90' x 160'.
3. A leachate collection system, utilizing 4" diameter collection pipe, was installed immediately above the 20-mil PVC membrane.

4. Approximately 6" to 12" of was placed above the PVC liner and compacted. Additional compacting aggregate may be added if needed for structural stability.
5. A four inch layer of special high-bitumen content asphalt was laid over the entire disposal area.
6. An asphalt dividing wall was provided across the containment area to provide separation of those cuttings which contain high quantities of salt from those which are relatively salt-free.
7. During drilling of the well, PPG will utilize closed system steel working pits provided with the drilling rig and a special salt-dissolving and cuttings washer system designed by PPG and utilized at previous wells. A side stream will be taken from the circulating mud system and directed through a flocculent addition system feeding a high speed centrifuge. The relatively dry cuttings will then be temporarily disposed in the above-described containment area. The clean brine will be sent back to the circulating mud system or to an approved disposal well. Excess volume generated during drilling of the well will all go through this system with the resulting brine going to an approved disposal system. The mud system remaining at the end of the well will be completely processed through this system so that the cuttings are placed in the above-described containment area and any resulting brines will be disposed in an approved disposal well.
8. The well will be drilled so that those solids generated above the Detroit River Salt which are relatively salt-free will be directed into one side of the containment area. At the top of the Detroit River Salt, the cuttings will then be directed into the other side of the above-described containment area, thus providing effective separation of the high salt content cuttings from those with low salt content.
9. It is anticipated that natural drainage of the cuttings will occur, which will result in essentially dry cuttings which will be amenable to hauling to a landfill. Our current plans are, with DNR approval, to haul the cuttings periodically to the Ottawa Farms Landfill.
10. The attached sketches show the rig layout and the solids containment area layout and corss-sections through each of these areas. Please note that we are also planning to asphalt pave the area under the rig and associated equipment.

Access to the wellsite will be from the West off 140th Avenue and will utilize the existing service road. No new road will need to be constructed.

Although significant concentrations of hydrogen sulfide gas are not expected, we cannot rule out the possibility of encountering this material during drilling operations. Appropriate precautionary measures, therefore, will be incorporated in the operational plan. In general, the Guidelines for Sour Oil and Gas Wells and Associated Facilities, prepared by the Interagency Sour Gas Coordinating Committee will be observed. The wellsite is well isolated from human habitation. The nearest residences are located over 1/4 mile Southwesterly of the surface location.

A temporary water well had been drilled for use in drilling the previous wells. This same water well will be used in drilling the proposed mineral well. Immediately following the drilling and completion operations of all wells which are part of this project, the well will be properly abandoned.

Upon completion of testing operations, if the well is not converted for solution mining, it will be plugged in accordance with Michigan Department of Natural Resources Instructions prior to abandonment. The drilling pad area will be fine graded, stabilized, and restored to its former condition. If the well is to be converted for solution mining, it will be plugged and abandoned following its useful life. This project is expected to have only a slight effect on the immediate environment.

### III. Possible Alternatives to the Proposed Well Location:

The proposed bottom hole location has been selected on the basis of a geologic interpretation. The surface location has been chosen on the basis of an extensive on site evaluation. By drilling this test well from a common drilling pad with others, a minimum disruption of the environment will result. Preparation of the drilling pad did not require extensive tree removal. The proposed project area is well isolated from surface waters and human habitation. We believe the site is generally well suited for the undertaking of this project and that adequate protection of the environment can be maintained at this location. For these reasons, we believe that drilling the test well from the surface location proposed is the best available alternative.


IV. Any Irreversible and Irretrievable Commitment of Resources:

The proposed project should not require a significant commitment of natural resources. The productivity of the land utilized for the drilling pad and access road will be lost during the life of the project but the surface resources of the drillsite will not be irreversibly committed. Drilling of the well will not curtail the use of the surrounding environment.

V. Summary:

In order to minimize surface disturbances, this exploratory well is to be directionally drilled from a common surface location which has been used for other wells in this 1/4 section. The total surface area necessary for this project encompass approximately 7 1/4 acres. The drilling pad is located on rolling, generally open, dormant land. Land use in the surrounding area is mixed agricultural and forest recreational. Natural drainage from the location is both Northeasterly and Northwesterly toward tributaries of the Muskegon River. There are no surface waters within 1/4 mile of the proposed wellsite. Appropriate drill site drainage and sedimentation control measures have been included in the operational plan. Although we do not anticipate sour gas at this location, we intend to proceed as if the possibility exists. Access to the wellsite will be from the West off 140th Avenue and will utilize the existing service road. We consider the environmental impact of this project to be minimal, and will make every effort to insure protection and preservation of the environment during the course of our drilling and testing operations.

Applicant's Representative



---

Comments by Department of Natural Resources Representative:

---

Authorized Representative

Surface Casing 13 3/8" in 17 1/2" hole

- A. Use insert float and Texas Pattern Shoe and lock to shoe joint with thread lock.
- B. No centralizers
- C. Circulate hole a minimum of one complete circulation
- D. Do not reciprocate casing
- E. Run bottom (red) wiper plug. Do not use if carrying LCM in cement.
- F. Pump 70 bbls. fresh water ahead of cement
- G. Cement with:
  - 1. 475 sx 50/50 Poz., 6% total gel, 3%  $\text{CaCl}_2$   
1.54ft<sup>3</sup>/sk, 13.3#/gal, 7.66 gals/sk
  - 2. 200 sx Class "A", 3%  $\text{CaCl}_2$   
1.18 ft<sup>3</sup>/sk, 15.6#/gal, 7.66 gals/sk

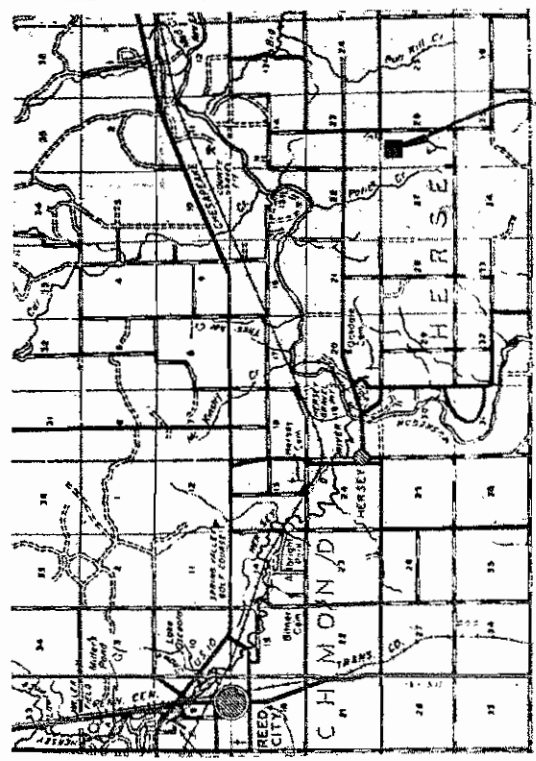
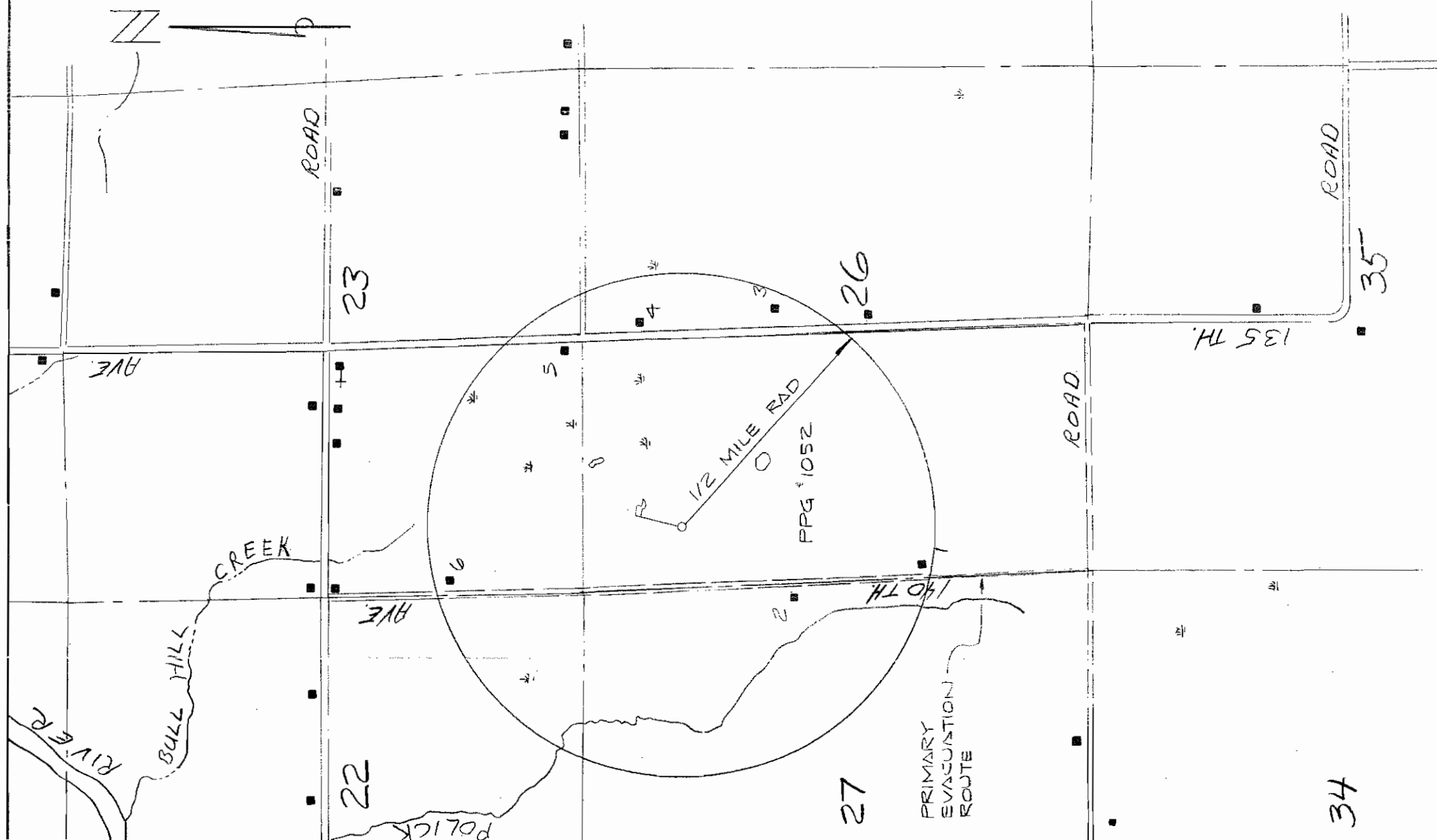
Intermediate Casing 9 5/8" in 12 1/4" hole

Recommended Procedure:

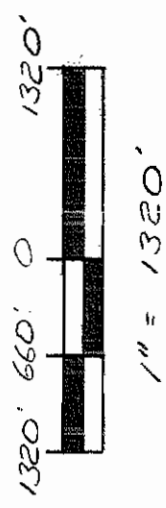
- A. Use float collar and guide shoe and lock to shoe joint with Halliburton Weld-A
- B. Run one centralizer 10' above guide shoe and four more at every other collar spacing.
- C. Circulate hole a minimum of one complete circulation and until the drag stabilizes.
- D. Reciprocate casing while circulating and cementing. Stop reciprocation just prior to bumping top plug.
- E. Run bottom (red) wiper plug. Do not use if carrying LCM in cement.
- F. Pump 30 bbls. fresh water ahead of cement.
- G. Cement with enough cement from caliper log to bring cement to surface on all intermediate casing strings.
- H. Run top (black) wiper plug.
- I. Displace with fresh water.

Casing Equipment: (9 5/8")

Regular guide shoe, float collar with auto fill, Halliburton weld-A (2), Centralizers (5)



LOCATION MAP  
NO SCALE



ISSUE NO.	BID DATE
B.G. DRN.	DATE
TOPO DRN.	2-7-85
PROFILE DRN.	DESIGN
APPROVED	ENG. DRN.
944	SCALE
	V: H: 1/1320

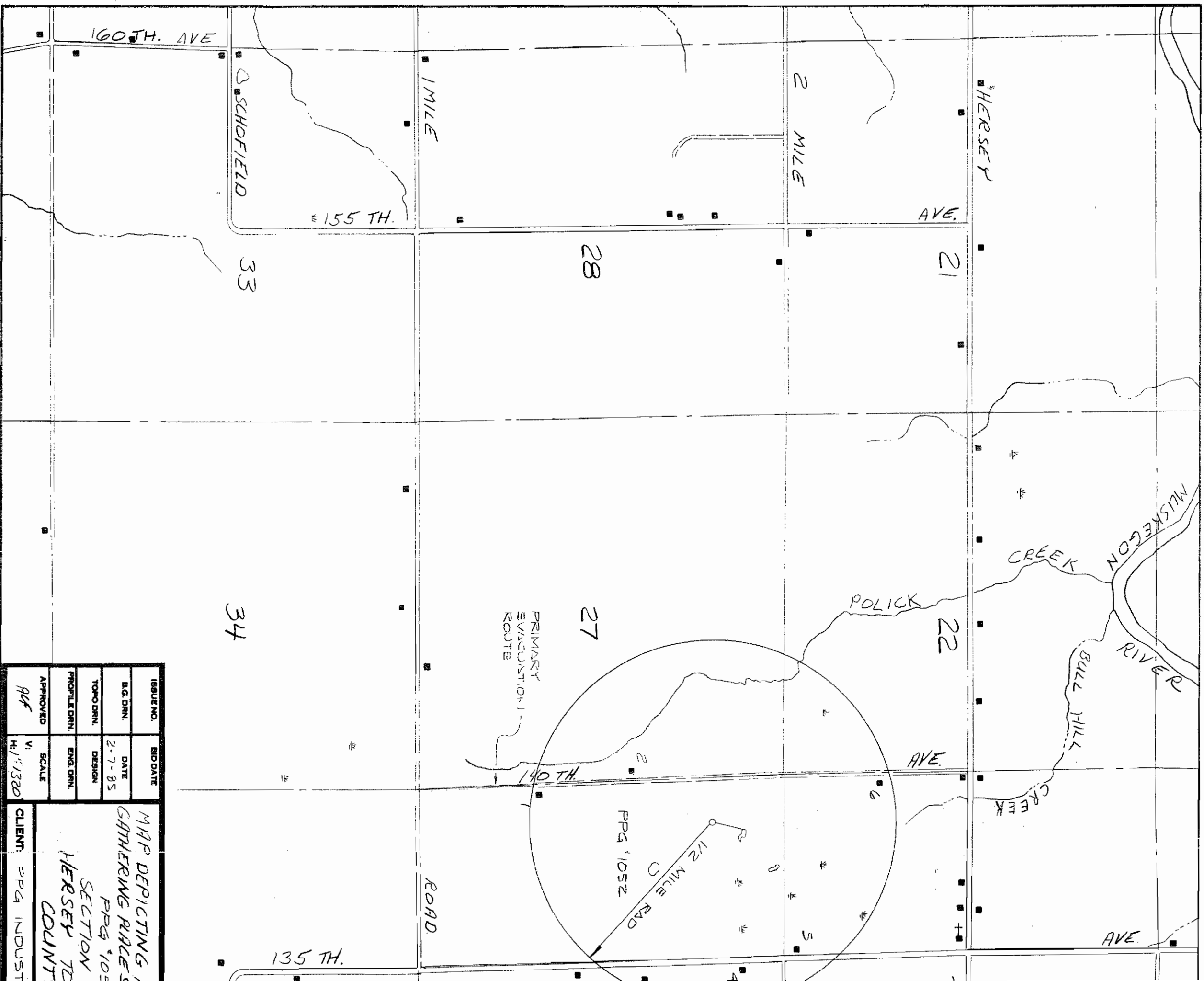
MAP DEPICTING RESIDENCES AND PUBLIC  
GATHERING PLACES AND EVACUATION ROUTES  
PPG #1052, WELLSITE,  
SECTION 26, T14N, R9W,  
HERSEY TOWNSHIP, OSCOLA  
COUNTY, MICHIGAN

CLIENT: PPG INDUSTRIES, INC.

**J.L. WILCOX & ASSOCIATES, INC.**  
ENGINEERS AND SURVEYORS  
7230 NORTH US-131 MANTON, MICHIGAN 49663

TOPO: LEVELS	SHEET	JOB NO.
1	1	85063

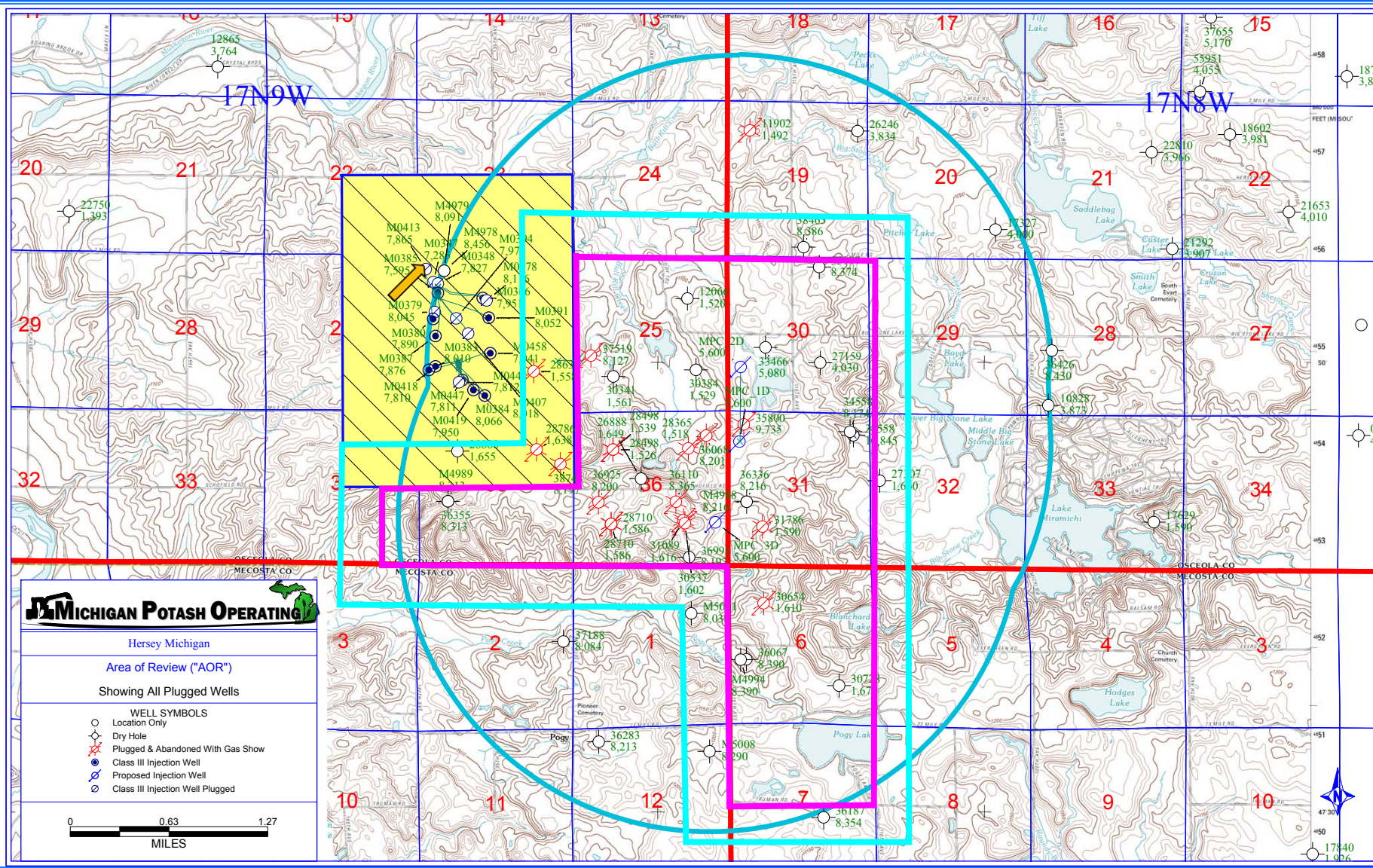




ISSUE NO.	BID DATE
B.G. DRN.	DATE
TOPO DRN.	DESIGN
PROFILE DRN.	ENG. DRN.
APPROVED	SCALE
94	V: H: 1/320

MAP DEPICTING  
GATHERING RANGES  
PPG 1052  
SECTION  
HERSEY TO  
COUNTY

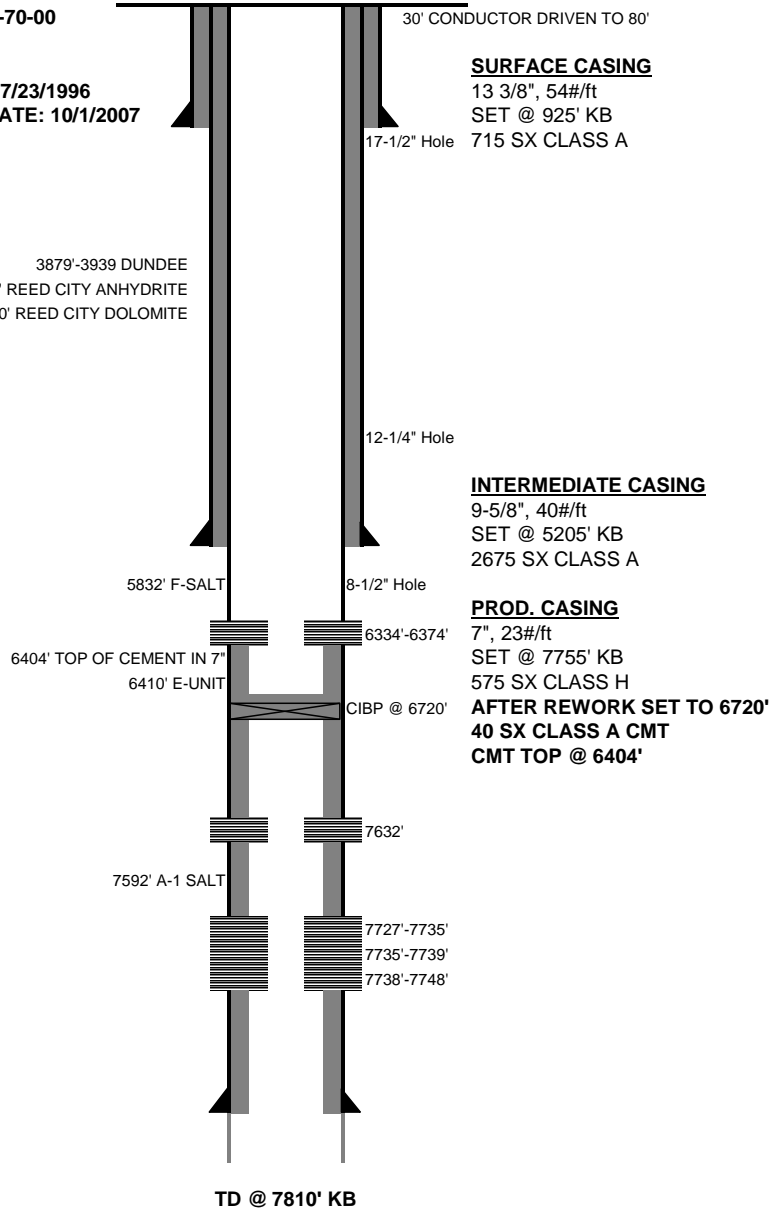
CLIENT: PPG INDUST



**KALIUM 2032**  
SW NW SW Sec 26 T17N R9W  
OSCEOLA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

PERMIT No. 00408  
API No. 21-133-00408-70-00  
GL @ 1137.3'  
KB @ 1151.3'  
WELL COMPLETION DATE: 7/23/1996  
PLUGGING COMPLETION DATE: 10/1/2007

UPDATED APRIL 2014 BY JLT



**KALIUM 2032 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
6/28/1996	SPUD.
7/20/1996	DRILLING COMPLETED.
	13 3/8" SET AT 925'; 715 SX CLASS A 9 5/8" SET AT 5205'; 2675 SX CLASS A 7" SET AT 7755'; 575 SX CLASS H WELL COMPLETED.
7/23/1996	
2/5/1997	REWORK COMMENCED. REMOVE D-LINER. RERUN TUBING. PFC INJECTION POINT 7738'.
2/13/1997	REWORK COMPLETED.
3/26/1997	REWORK COMMENCED. REMOVE TUBING. RUN OCHL. LOG. INJECTION POINT 7738'.
3/31/1997	REWORK COMPLETED.
5/28/1997	REWORK COMMENCED. REMOVE TUBING. CLEAR TUBING. RERUN TUBING. INJECTION POINT 7738'.
5/28/1997	REWORK COMPLETED.
9/15/1997	REWORK COMMENCED. REMOVE TUBING. PERFORATE CASING FROM 7735'-7739'. RERUN SPEARED TUBING TO 7760'.
9/15/1997	REWORK COMPLETED.
1/13/1998	REWORK COMMENCED. TRIP TUBING STANDING. RUN THL. SAT HIGH. RUN SB/CCL. PULL LAYING. RUN FLAT BOTTOM MILL. MILL FROM 7748'-7765'. PULL LAYING. RUN THL TO 7760'.
2/14/1998	REWORK COMPLETED.
2/27/1998	REWORK COMMENCED. TRIP TUBING STANDING. STRING PARTED. RUN OVERSHOOT. TUBING STUCK. RUN FREEPOINT. WORK TUBING. RETRIEVE 5 JTS THEN 8 JTS THEN 7 JTS. RUN W.D. PIPE. WASH TO 2000'. LAY DOWN 2-7/8 THEN W.D. TO 4100'. LAYDOWN 2-7/8. PULL REMAINDER OF THL. RUN THL. LAND BOTTOM AT 7760'.
3/13/1998	REWORK COMPLETED.
4/14/1998	REWORK COMMENCED. TRIP THL STANDING. PERFORATE 7" CASING 7727'-7735'. RERUN THL. LAND BOTTOM AT 7735' BY TALLY.
4/15/1998	REWORK COMPLETED.
5/5/1998	REWORK COMMENCED. TRIP THL STANDING. PERFORATE 7" CASING 7717'-7727'. RERUN THL. LAND BOTTOM AT 7703' BY TALLY.
5/8/1998	REWORK COMPLETED.
5/26/1998	REWORK COMMENCED. TRIP THLP STANDING. RERUN THL. LAND BOTTOM AT 7760' BY PFC.
5/28/1998	REWORK COMPLETED.
11/17/1998	REWORK COMMENCED. PULL THL STANDING. PERF 7685'-7695'. TRIP IN HOLE WITH THL. LAND THL AT 7685.5'.
11/19/1998	REWORK COMPLETED.
12/10/1998	REWORK COMMENCED. PULL THL STANDING. RUN MILL. MILL FROM 7672'-7720'. RERUN THL. LAND BOTTOM AT 7718'.
12/12/1998	REWORK COMPLETED.
2/17/1999	REWORK COMMENCED. LINER DAMAGED. TRIP STANDING. CHANGE LINER JOINT AND PFC. LOWER LINER 31'.
2/18/1999	REWORK COMPLETED.
6/29/1999	REWORK COMMENCED. PULL THL STANDING. TUBING STUCK. SHO W/STRING SHOT @ 7680', 7651' & 5750' - CAME FREE. TRIP OUT LAYING. TRIP IN
7/14/1999	REWORK COMPLETED.
9/9/1999	REWORK COMMENCED. PULL THL. LOST 2 JNTS. TRIP IN HOLE. MILL 7599'-7750'. TRIP OUT. MAKE UP J-SLOT & MANDRILL. TRIP IN. LINER PLUGGED. UNPLUG PIPE. TRIP IN.
9/23/1999	REWORK COMPLETED.
7/11/2001	REWORK COMMENCED. RIG UP. RUN IN HOLE W/SEVERING TOO. - SHUT OFF AT 7600'. DIDN'T PART. RUN 2ND SEVERING TOOL - SHUT OFF AT 7190'.
7/31/2001	REWORK COMPLETED.
1/21/2002	REWORK COMMENCED. PARTED 7" CASING AT 2000'. RAN CASING PATCH TO REPIAR. MIT.
1/21/2002	REWORK COMPLETED.
1/19/2005	REWORK COMMENCED. PIPE WAS PARTED AT 2300'. RAN O.D. CASING PATCH AND PATCHED PIPE AT 2312'. MIT.
1/21/2005	REWORK COMPLETED.
10/10/2006	REWORK COMMENCED. PULL 4-1/2" CASING. SET BRIDGE PLUG @ 6720'. RUN LOGS. SET 40 SX PLUG. SECTION MILL 7" CASING 6374'-6384'. PERFORATE CASING FROM 6334-6374.
1/10/2007	REWORK COMPLETED.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D C. 20460**WELL REWORK RECORD****NAME AND ADDRESS OF PERMITTEE**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, Mi 49639**NAME AND ADDRESS OF CONTRACTOR**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, Mi 49639Locate Well and Outline Unit on  
Section Plat - 640 AcresSTATE  
MICOUNTY  
OsceolaPERMIT NUMBER  
MI-133-3G-A002**SURFACE LOCATION DESCRIPTION**

SE 1/4 of NW 1/4 of SW 1/4 of Section 26 Township 17N Range 9W

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface

Location 898 ft From (N/S) N Line of Quarter SectionAnd 1319 ft From (E/W) W Line of Quarter Section**WELL ACTIVITY**

- ☐ Brine Disposal
- ☐ Enhanced Recovery
- ☐ Hydrocarbon Storage
- ☒ Solution Mining
- Lease Name

Total Depth Before Rework

7755'

Total Depth After Rework

6404'

Date Rework Commenced

10/10/2006

Date Rework Completed

1/10/2007

**TYPE OF PERMIT**☐ Individual☒ AreaNumber of Wells 23Well Number 2032**WELL CASING RECORD - BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	90	Driven				
13 3/8	925	715	A			
9 5/8	5205	2675	A			
7	7755	575	A	7632	7642	

**WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)**

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
7	6720	40	A	6334	6374	Cement Top @ 6404"

**DESCRIBE REWORK OPERATIONS IN DETAIL**

USE ADDITIONAL SHEETS IF NECESSARY

Pull 4 1/2 inch casing-set bridge plug @ 6720-Run Logs- Set 40 sack plug- Section mill 7

inch casing 6374-6384-Perforate casing from 6334-6374.

**WIRE LINE LOGS, LIST EACH TYPE**

Log Types	Logged Intervals
CBL_GAMMA	0-6720
TEMP_GAMMA	0-6720

**CERTIFICATION**

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE

ROBERT SCHWEITZER  
PRODUCTION AND MINING SUPERINTENDENT

SIGNATURE

Robert Schweitzer

DATE SIGNED

2/5/2007

## APPLICATION TO:

- ☒ CHANGE WELL STATUS OR  
☐ PLUG AND ABANDON WELL

regulated by authority of Part 615 Supervisor of Wells or Part 625 Mineral  
 Wells, of Act 451 PA 1994 as amended. Non-submission and/or  
 falsification of this information may result in fines and/or imprisonment

☐ Part 615 Oil or Gas Well

☒ Part 625 Mineral Well

Change of well status requested to:

- ☐ Plug back ☐ Perforate ☐ Temporarily abandon  
☐ Convert to ☒ Other Raise horizon

Last production/injection rate and type of fluid

Brine @ 250 g.p.m.

Brief description of project

Raise solution mining horizon from A-1 salt to the F-salt

Permit number

M-408

API number

Type of well

Solution Mining

Name and address of permittee

Mosaic Potash Hersey

1395 135<sup>th</sup> Ave

Hersey, Michigan 49639

Well name and number

2032

Well location

SW 1/4 of NW 1/4 of SW 1/4 Section 26 T 17n R 9w

Township

Hersey

County

Osceola

Date drilling completed

20/7/96

Date last produced/utilized

13/11/05

Work to be done by

Mosaic Hersey

Starting date

01/04/06

## CASING AND CEMENTING RECORD

Hole dia	Casing dia & wt/ft	Depths set	Cement quantity, type, additives	Cement top	Perforations
17 1/2	13 3/8-54.5#	925	715 sacks class A	surface	
12 1/4	9 5/8-40#	5205	2675 sacks class A	Surface	
8 1/2	7- 23#	7755	575 sacks class H	5500 Feet	7632

Formation record (formation and depth of top, oil, gas and water shows, etc.):

formation	depth	Measured
F-salt	5832	
E-unit	6410	

Proposed mining  
horizon (Na only)

A-1 salt	7592
----------	------

Current mining  
horizon (K+Na)

Detail proposed procedures:

Set bridge plug at 6750 - Cement with class A cement 300 feet of fill-Section mill casing from 6400-6410- Run tubing string and start cavity development

Name/signature (authorized representative):

Date:

FOR OFFICE OF GEOLOGICAL SURVEY USE ONLY

DEQ additional requirements:

NOTIFY RAY VUGRINOVICH (517 241 1532) AND MIKE MOSS  
 (231-775-3960 X 6342) AT LEAST 24 HRS PRIOR TO SETTING  
 BRIDGE PLUG

RECEIVED

READ 7 9 2006

☐ Yes ☐ No ☒ Not applicable Production tests to commence within 10 days of completion and to be filed

☒ Yes ☐ No Service company records are to be filed

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

Approved by DEQ:

Raymond Vugrinovich

Office:

LANSING

Approval date:

3/14/2006

Termination Date:

3/14/2007

Submit original and three (3) copies of this application to the District Office within 60 days of change of well status

Note: Three copies of Record of Well Plugging or Change of Well status (EQP 7200-8) and any requested  
 service company records are to be filed within 60 days of completion at the District Office



## MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

## APPLICATION TO:

- ☒ CHANGE WELL STATUS OR  
☐ PLUG AND ABANDON WELL

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

☐ Part 615 Oil or Gas Well ☒ Part 625 Mineral Well

## Change of well status requested to:

- ☐ Plug back ☐ Perforate ☐ Temporarily abandon  
☐ Convert to ☒ Other Raise horizon

## Last production/injection rate and type of fluid

Brine @ 250 g.p.m.

## Brief description of project

Raise solution mining horizon from A-1 salt to the F-salt.

## Work to be done by

Mosaic Hersey

## Permit number

M-408

## Type of well

Solution Mining

## API number

## Name and address of permittee

Mosaic Potash Hersey  
1395 135<sup>th</sup> Ave  
Hersey, Michigan 49639

## Well name and number

2032

## Well location

SW 1/4 of NW 1/4 of SW 1/4 Section 26 T 17N R 9W

## Township

Hersey

## County

Osceola

## Date drilling completed

20/7/96

## Date last produced/utilized

13/11/05

## Starting date

01/04/06

## CASING AND CEMENTING RECORD

Hole dia	Casing dia & wt/ft	Depths set	Cement quantity, type, additives	Cement top	Perforations
17 1/2	13 3/8-54.5#	925	715 sacks class A	surface	
12 1/4	9 5/8-40#	5205	2675 sacks class A	Surface	
8 1/2	7- 23#	7755	575 sacks class H	5500 Feet	7632

## Formation record (formation and depth of top, oil, gas and water shows, etc.):

formation	depth	Measured	
F-salt	5832		Proposed mining horizon (Na only)
E-unit	6410		
A-1 salt	7592		Current mining horizon (K+Na)

## Detail proposed procedures:

Set bridge plug at 6750 - Cement with class A cement 300 feet of fill-Section mill casing from 6400-6410- Run tubing string and start cavity development.

Name/signature (authorized representative):

Date:

FOR OFFICE OF GEOLOGICAL SURVEY USE ONLY

## DEQ additional requirements:

NOTIFY RAY VUGRINOVICH (517 241 1532) AND MIKE MOSS  
(231-775-3960 X 6342) AT LEAST 24 HRS PRIOR TO SETTING  
BRIDGE PLUG

RECEIVED

MAR 08 2006

- ☐ Yes ☐ No ☒ Not applicable Production tests to commence within 10 days of completion and to be filed  
☒ Yes ☐ No Service company records are to be filed

ENVIRONMENTAL QUALITY  
OFFICE OF GEOLOGICAL SURVEY

Approved by DEQ:

Office:

Approval date:

Termination Date:

Raymond Vugrinovich

LANSING

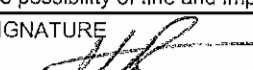
3/14/2006

3/14/2007

Submit original and three (3) copies of this application to the District Office within 60 days of change of well status.  
Note: Three copies of Record of Well Plugging or Change of Well status (EQP 7200-8) and any requested service company records are to be filed within 60 days of completion at the District Office.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY																																																																								
WASHINGTON DC 20460																																																																								
EPA		WELL REWORK RECORD																																																																						
NAME AND ADDRESS OF PERMITTEE				NAME AND ADDRESS OF CONTRACTOR																																																																				
IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639				IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639																																																																				
LOCATE WELL AND OUTLINE UNIT ON			STATE	COUNTY		PERMIT NUMBER																																																																		
SECTION PLAT -- 640 ACRES			MI	Osceola		MI-133-3G-A002																																																																		
<div style="text-align: center;">N</div> <table border="1" style="width: 100px; height: 100px; margin: auto;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: 0; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: 0; top: 50%; transform: translateY(-50%);">E</div> <div style="position: absolute; left: 10%; top: 70%;">X</div>																																																																			SURFACE LOCATION DESCRIPTION					
SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W																																																																								
Locate well in two directions from nearest lines of quarter section and drilling unit																																																																								
Surface Location 898ft from (N/S) N Line of quarter section and 1319 ft. from (E/W) W line of quarter section																																																																								
			WELL ACTIVITY		Total Depth Before Rework	TYPE OF PERMIT																																																																		
			Brine Disposal		7760	Individual																																																																		
			Enhanced Recovery		Total Depth After Rework	X Area																																																																		
			Hydrocarbon Storage		7760	Number of Wells 17																																																																		
			X Sol'n Mining		Date Rework Commenced	Well Number																																																																		
Lease Name			7/11/2001		2032																																																																			
Kalium Hersey			Date Rework Completed		7/31/2001																																																																			
WELL CASING RECORD - BEFORE REWORK																																																																								
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																		
Size	Depth	Sacks	Type	From	To																																																																			
30	80	Driven																																																																						
13 3/8	925	715	A																																																																					
9 5/8	5205	2675	A																																																																					
7	7739	575	H																																																																					
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																																								
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																		
Size	Depth	Sacks	Type	From	To																																																																			
Describe rework operations in detail					Wire line logs, list each type																																																																			
Use additional sheets if necessary					Log Types		Logged intervals																																																																	
Rig up. Run in hole w/severing tool-shut off @7600'. Didn't part.					CCL																																																																			
Run 2nd severing tool-shut off @7190'. Start milling @7200'-7763'.																																																																								
Land liner @7740'. Complete MIT Test.																																																																								
CERTIFICATION																																																																								
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).																																																																								
NAME AND OFFICIAL TITLE (Please type or print)				SIGNATURE			DATE SIGNED																																																																	
Kyle Barbot Minefield Supervisor							11-16-01																																																																	



**REQUEST FOR TRANSFER OF PERMIT**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended Non-submission and/or falsification of this information may result in fines and/or imprisonment


☐ Part 615 Oil/Gas Well☒ Part 625 Mineral Well

Permit number M-408	Well type Brine Prod.	Current true vertical depth 7556
Well name and number Kalium Hersey 2032		
Surface location SE 1/4 NW 1/4 SW 1/4 Section 26 T 17N R 9W		
Township Hersey		County Osceola


NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13)

**This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.**

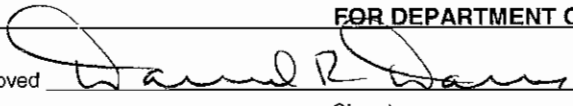
**TRANSFER OF A PERMIT FROM:**

Name(s) of Selling Permittee(s) Kalium Chemicals, Limited		Fed ID # or SS # 38-3545577	
Address: Number and Street, City or Town, State, ZIP Code Telephone 1395, 135th Avenue Hersey, MI, 49639		231-832-3755	
All permits rights and responsibilities are discharged by:			
Kalium Chemicals, Limited Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**TRANSFER OF A PERMIT TO:**

Name(s) of Acquiring Permittee(s): IMC Potash Hersey Inc		Fed ID # or SS # ME0132184	
Address: Number and Street, City or Town State ZIP Code 1395, 135th Avenue Hersey, MI, 49639		Telephone 231-832-3755	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law regulations and orders			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <u>Royal Bank of Canada</u>			
<input checked="" type="checkbox"/> Blanket <input checked="" type="checkbox"/> On File Bond Number <u>P43087C00008</u> Amount <u>\$25,000</u>			
<input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
IMC Potash Hersey Inc. Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY**

Approved  Signature	MAY 08 2001 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner
---	---------------------	--

## WELL REWORK RECORD

10-12-99

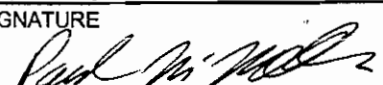


~~MAR 17 1999~~

GEOLOGICAL SURVEY DIV.  
ENVIRONMENTAL QUALITY


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY									
WASHINGTON, DC 20460									
EPA		WELL REWORK RECORD							
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639				NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639					
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES				STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002			
<div>W</div> <div>N</div> <div>S</div> <div>E</div>				SURFACE LOCATION DESCRIPTION SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 898ft from (N/S) N Line of quarter section and 1319 ft. from (E/W) W line of quarter section					
				WELL ACTIVITY		Total Depth Before Rework		TYPE OF PERMIT	
				Brine Disposal		7760		Individual	
				Enhanced Recovery		Total Depth After Rework		X Area	
				Hydrocarbon Storage		7760		Number of Wells 17	
				X Sol'n Mining		Date Rework Commenced		Well Number	
				Lease Name		2/17/99		2032	
				Kalium Hersey		Date Rework Completed			
						2/18/99			
WELL CASING RECORD - BEFORE REWORK									
Casing		Cement		Perforations		Acid or Fracture Treatment Record			
Size	Depth	Sacks	Type	From	To				
30	80	Driven							
13 3/8	925	715	A						
9 5/8	5205	2675	A						
7	7739	575	H						
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)									
Casing		Cement		Perforations		Acid or Fracture Treatment Record			
Size	Depth	Sacks	Type	From	To				
30	80	Driven							
13 3/8	925	715	A						
9 5/8	5205	2675	A						
7	7739	575	H	7727	7735	4 SH/FT			
Describe rework operations in detail Use additional sheets if necessary					Wire line logs, list each type				
Liner damaged. Trip standing. Change liner joint and PFC. Lower liner 31'.					Log Types		Logged intervals		
CERTIFICATION									
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).									
NAME AND OFFICIAL TITLE (Please type or print)				SIGNATURE			DATE SIGNED		
Paul McMillen							03/09/99		
Minefield Supervisor									



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY																																																																				
WASHINGTON, DC 20460																																																																				
EPA		WELL REWORK RECORD																																																																		
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639				NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639																																																																
LOCATE WELL AND OUTLINE UNIT ON <u>SECTION PLAT - 640 ACRES</u>		STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002 <u>M408</u>																																																																
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 100px; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: -40px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -40px; top: 50%; transform: translateY(-50%);">E</div>																																																																		SURFACE LOCATION DESCRIPTION <u>SE1/4 of NW1/4 of SW1/4 of 1/4 of Section 26 Township 17N Range 9W</u> Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location <u>898</u> ft from (N/S) <u>N</u> Line of quarter section and <u>1319</u> ft. from (E/W) <u>W</u> line of quarter section		
WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework <u>7760</u>	TYPE OF PERMIT <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area																																																																	
Lease Name Kalium Hersey		Total Depth After Rework <u>7760</u>	Number of Wells <u>17</u>																																																																	
		Date Rework Commenced <u>11/17/98</u>	Well Number <u>2032</u>																																																																	
		Date Rework Completed <u>11/19/98</u>																																																																		
WELL CASING RECORD - BEFORE REWORK																																																																				
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																														
Size	Depth	Sacks	Type	From	To																																																															
30	80	Driven																																																																		
13 3/8	925	715	A																																																																	
9 5/8	5205	2675	A																																																																	
7	7739	575	H																																																																	
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																																				
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																														
Size	Depth	Sacks	Type	From	To																																																															
30	80	Driven																																																																		
13 3/8	925	715	A																																																																	
9 5/8	5205	2675	A																																																																	
7	7739	575	H	7727	7735	4 SH/FT																																																														
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type																																																																
				Log Types		Logged intervals																																																														
Pull THL standing. Perf 7685 - 7695'. Trip in hole with THL. Land				G/N Log		7756-7490																																																														
THL at 7685.5.																																																																				
CERTIFICATION																																																																				
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).																																																																				
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor				SIGNATURE 		DATE SIGNED <u>12/23/98</u>																																																														



JUN 8 1998

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON DC 20460 <b>EPA WELL REWORK RECORD</b>																																																																				
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639																																																																	
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES		STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002																																																																
<div style="text-align: center;">N</div> <table border="1" style="width: 100px; height: 100px; margin: auto;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: 0; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: 0; top: 50%; transform: translateY(-50%);">E</div>																																																																		SURFACE LOCATION DESCRIPTION <u>SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W</u> Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location <u>898ft</u> from (N/S) <u>N</u> Line of quarter section and <u>1319</u> ft. from (E/W) <u>W</u> line of quarter section		
WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol n Mining		Total Depth Before Rework 7760	TYPE OF PERMIT <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area																																																																	
Lease Name Kalium Hersey		Total Depth After Rework 7760	Number of Wells <u>18</u>																																																																	
		Date Rework Commenced 5/26/98	Well Number 2032																																																																	
		Date Rework Completed 5/28/98																																																																		
<b>WELL CASING RECORD - BEFORE REWORK</b>																																																																				
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																														
Size	Depth	Sacks	Type	From	To																																																															
30	80	Driven																																																																		
13 3/8	925	715	A																																																																	
9 5/8	5205	2675	A																																																																	
7	7739	575	H																																																																	
<b>WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)</b>																																																																				
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																														
Size	Depth	Sacks	Type	From	To																																																															
30	80	Driven																																																																		
13 3/8	925	715	A																																																																	
9 5/8	5205	2675	A																																																																	
7	7739	575	H	7727	7735	4 SH/FT																																																														
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type																																																																
				Log Types	Logged intervals																																																															
Trip THLP stding. Rerun THL. Land bottom at 7760' by PFC.				G/N Log	7756-7490																																																															
<b>CERTIFICATION</b>																																																																				
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true accurate and complete I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).																																																																				
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE 		DATE SIGNED 06/02/98																																																															



Form Approved. OMB No 2040-0042. Expires 6-30-98

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY							
WASHINGTON, DC 20460							
<b>EPA</b>		<b>WELL REWORK RECORD</b>					
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639				NAME AND ADDRESS OF CONTRACTOR IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639			
LOCATE WELL AND OUTLINE UNIT ON <u>SECTION PLAT -- 640 ACRES</u>		STATE MI	COUNTY Osceola		PERMIT NUMBER MI-133-3G-A002		
		SURFACE LOCATION DESCRIPTION <u>SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W</u> Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location <u>898ft</u> from (N/S) <u>N</u> Line of quarter section and <u>1319 ft.</u> from (E/W) <u>W</u> line of quarter section					
		WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework 7760		TYPE OF PERMIT <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area Number of Wells <u>18</u>  Well Number 2032	
		Lease Name Kalium Hersey		Total Depth After Rework 7760			
				Date Rework Commenced 4/14/98			
				Date Rework Completed 4/15/98			
<b>WELL CASING RECORD - BEFORE REWORK</b>							
Casing		Cement		Perforations		Acid or Fracture Treatment Record	
Size	Depth	Sacks	Type	From	To		
30	80	Driven					
13 3/8	925	715	A				
9 5/8	5205	2675	A				
7	7739	575	H				
<b>WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)</b>							
Casing		Cement		Perforations		Acid or Fracture Treatment Record	
Size	Depth	Sacks	Type	From	To		
30	80	Driven					
13 3/8	925	715	A				
9 5/8	5205	2675	A				
7	7739	575	H	7727	7735	4 SH/FT	
Describe rework operations in detail Use additional sheets if necessary					Wire line logs, list each type		
Trip THL stding. Perforate 7' casing 7727' - 7735'. Rerun THL. Land bottom at 7735 by Tally.					Log Types		Logged intervals
					SB/CCL		7600-7740
					PFC		7600-7748
<b>CERTIFICATION</b>							
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true accurate and complete I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).							
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor				SIGNATURE 		DATE SIGNED 05/01/98	

MAR 26 1998

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY						
WASHINGTON DC 20460						
EPA		WELL REWORK RECORD				
NAME AND ADDRESS OF PERMITTEE IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639			
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES			STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002	
			SURFACE LOCATION DESCRIPTION SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 898ft from (N/S) N Line of quarter section and 1319 ft. from (E/W) W line of quarter section			
			WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol n Mining		Total Depth Before Rework 7760	TYPE OF PERMIT Individual
			Total Depth After Rework 7760		<input checked="" type="checkbox"/> Area	
			Date Rework Commenced 2/27/98		Number of Wells 16	
Lease Name Kalium Hersey			Date Rework Completed 3/13/98		Well Number 2032	
WELL CASING RECORD - BEFORE REWORK						
Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
13 3/8	925	715	A			
9 5/8	5205	2675	A			
7	7739	575	H			
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)						
Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
13 3/8	925	715	A			
9 5/8	5205	2675	A			
7	7739	575	H	7735	7739	4 SH/FT
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type		
				Log Types		Logged intervals
Trip tubing standing. String parted. Run overshoot. Tubing stuck.				SB/CCL		7600-7740
Run freepoint. Work tubing. Retrieve 5 Jts then 8 Jts then 7 Jts				PFC		7600-7748
Run W.D. Pipe. Wash to 2000ft. Laydown 2 7/8 then W.D. to 4100'. Laydown 2 7/8. Pull remainder of THL. Run THL land bottom at 7760.						
CERTIFICATION						
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true accurate and complete I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).						
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE 			DATE SIGNED 03/24/98

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY						
WASHINGTON DC 20460						
EPA WELL REWORK RECORD						
<b>NAME AND ADDRESS OF PERMITTEE</b> IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639				<b>NAME AND ADDRESS OF CONTRACTOR</b> IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639		
<b>LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT – 640 ACRES</b>		<b>STATE</b> MI	<b>COUNTY</b> Osceola		<b>PERMIT NUMBER</b> MI-133-3G-A002	
		<b>SURFACE LOCATION DESCRIPTION</b> <u>SE1/4 of NW1/4 of SW1/4 of 1/4 of Section 26 Township 17N Range 9W</u> Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location <u>898ft</u> from (N/S) <u>N</u> Line of quarter section and <u>1319 ft.</u> from (E/W) <u>W</u> line of quarter section				
		<b>WELL ACTIVITY</b> <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input checked="" type="checkbox"/> Hydrocarbon Storage  <input checked="" type="checkbox"/> Sol'n Mining Lease Name Kalium Hersey		<b>Total Depth Before Rework</b> 7760  <b>Total Depth After Rework</b> 7760  <b>Date Rework Commenced</b> 1/13/98  <b>Date Rework Completed</b> 2/14/98		<b>TYPE OF PERMIT</b> <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area Number of Wells <u>16</u>  Well Number 2032
<b>WELL CASING RECORD - BEFORE REWORK</b>						
<b>Casing</b>		<b>Cement</b>		<b>Perforations</b>		<b>Acid or Fracture Treatment Record</b>
<b>Size</b>	<b>Depth</b>	<b>Sacks</b>	<b>Type</b>	<b>From</b>	<b>To</b>	
30	80	Driven				
13 3/8	925	715	A			
9 5/8	5205	2675	A			
7	7739	575	H			
<b>WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)</b>						
<b>Casing</b>		<b>Cement</b>		<b>Perforations</b>		<b>Acid or Fracture Treatment Record</b>
<b>Size</b>	<b>Depth</b>	<b>Sacks</b>	<b>Type</b>	<b>From</b>	<b>To</b>	
30	80	Driven				
13 3/8	925	715	A			
9 5/8	5205	2675	A			
7	7739	575	H	7735	7739	4 SH/FT
<b>Describe rework operations in detail</b> Use additional sheets if necessary Trip tubing standing. Run THL. Sat high. Run SB/CCL. Pull laying. Run flat bottom mill. Mill from 7748'-65'. Pull laying. Run THL to 7760'					<b>Wire line logs, list each type</b>	
					<b>Log Types</b>	<b>Logged intervals</b>
					SB/CCL	7600-7740
					PFC	7600-7748
<b>CERTIFICATION</b>						
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).						
<b>NAME AND OFFICIAL TITLE (Please type or print)</b> Paul McMillen Minefield Supervisor				<b>SIGNATURE</b> 		<b>DATE SIGNED</b> 03/18/98

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY						
WASHINGTON DC 20460						
<b>EPA</b>		<b>WELL REWORK RECORD</b>				
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd. 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kalium Ltd. 1395 135th Avenue Hersey, MI 49639			
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES		STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002		
<div style="text-align: center;">N</div> <div style="text-align: center;">S</div> <div style="position: absolute; left: -30px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -30px; top: 50%; transform: translateY(-50%);">E</div>		SURFACE LOCATION DESCRIPTION <u>SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W</u> Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location <u>898 ft.</u> from (N/S) <u>N</u> Line of quarter section and <u>1319 ft.</u> from (E/W) <u>W</u> line of quarter section				
		WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework 7760	TYPE OF PERMIT Individual	
		Lease Name Kalium Hersey		Total Depth After Rework 7760	<input checked="" type="checkbox"/> Area Number of Wells <u>16</u>	
				Date Rework Commenced 9/15/97	Well Number 2032	
		Date Rework Completed 9/15/97				
<b>WELL CASING RECORD - BEFORE REWORK</b>						
Casing		Cement		Perforations		
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
13 3/8	925	715	A			
9 5/8	5205	2675	A			
7	7739	575	H			
<b>WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)</b>						
Casing		Cement		Perforations		
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
13 3/8	925	715	A			
9 5/8	5205	2675	A			
7	7739	575	H	7735	7739	
				4 SH/FT		
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type		
				Log Types	Logged intervals	
Remove tubing. Perforate casing from 7735'-7739' Rerun speared tubing to 7760'				G/N - PFC	7600'-7760'	
<b>CERTIFICATION</b>						
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true accurate, and complete I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).						
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE 		DATE SIGNED 10/22/97	



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON DC 20460

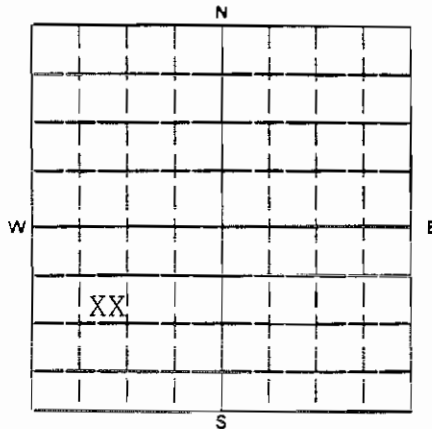
## WELL REWORK RECORD

APR 2 1997

## NAME AND ADDRESS OF PERMITTEE

IMC Kalium  
1395 135th Avenue  
Hersey, MI 49639

## NAME AND ADDRESS OF CONTRACTOR

IMC Kalium  
1395 135th Avenue  
Hersey, MI 49639LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRESSTATE  
MI

COUNTY

Osceola

PERMIT NUMBER

MI-133-3G-A002

## SURFACE LOCATION DESCRIPTION

SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W

## LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 898 N  
Location ft from (N/S) Line of quarter section  
and 1319 W Line of quarter section

## WELL ACTIVITY

- ☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage  
☒ Sol'n Mining  
 Lease Name

Kalium Hersey

## Total Depth Before Rework

7760

## Total Depth After Rework

7760

## Date Rework Commenced

02/05/97

## Date Rework Completed

02/13/97

## TYPE OF PERMIT

☐ Individual☒ Area

Number of Wells 16

Well Number

2032

## WELL CASING RECORD — BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
13-3/8	925	715	A			
9-5/8	5205	2675	A			
7	7755	575	H			

## WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
13-3/8	925	715	A			
9-5/8	5205	2675	A			
7	7755	575	H	7738	7748	4 SH/FT

## DESCRIBE REWORK OPERATIONS IN DETAIL

USE ADDITIONAL SHEETS IF NECESSARY

## WIRE LINE LOGS, LIST EACH TYPE

Log Types

Logged Intervals

Remove D-Liner Rerun tubing  
PFC injection point  
7738 feet

PFC

7600' - 7400'

## CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please type or print)

Paul McMillen  
Minefield Supervisor

SIGNATURE

DATE SIGNED

04/11/97



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON DC 20460

## WELL REWORK RECORD

MAY 02 1997

## NAME AND ADDRESS OF PERMITTEE

IMC KALIUM  
1395 135th Avenue  
Hersey, MI 49639

## NAME AND ADDRESS OF CONTRACTOR

IMC KALIUM  
1395 135th Avenue  
Hersey, MI 49639LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRES

N									
S									

W E

XX

STATE  
MI

COUNTY

Osceola

PERMIT NUMBER

MI-133-3G-A002

## SURFACE LOCATION DESCRIPTION

SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W

## LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 898  
Location 1319 ft from (N/S) N Line of quarter section  
and ft from (E/W) W Line of quarter section

## WELL ACTIVITY

☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage  
☒ Sol'n Mining  
 Lease Name  
 Kalium Hersey

## Total Depth Before Rework

7760

## Total Depth After Rework

7760

## Date Rework Commenced

03/26/97

## Date Rework Completed

03/31/97

## TYPE OF PERMIT

☐ Individual  
☒ Area  
 Number of Wells 16  
 Well Number 2032

## WELL CASING RECORD — BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	Driven				
13-3/8	925	715	A			
9-5/8	5205	2675	A			
7	7755	575	H			

## WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30	80	driven				
13-3/8	925	715	A			
9-5/8	5205	2675	A			
7	7755	575	H	7738	7748	4 SH/FT

## DESCRIBE REWORK OPERATIONS IN DETAIL

USE ADDITIONAL SHEETS IF NECESSARY

 Remove tubing. Run OCHL. Log.  
 Injection point.  
 7738 feet

## WIRE LINE LOGS. LIST EACH TYPE

Log Types

Logged Intervals

OCHL

7738 to surface

## CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please type or print)

Paul McMillen  
Minefield Supervisor

SIGNATURE

DATE SIGNED

04/30/97

# RECORD OF WELL DRILLING OR DEEPENING

USE APPROPRIATE BLOCKS. FOR ITEMS NOT LISTED SUBMIT ATTACHMENTS

REQUIRED BY AUTHORITY OF

☐ ACT 61, P.A. 1939, AS AMENDED  
(Submit 2 copies within 30 days  
of completion)

☒ ACT 315, P.A. 1969, AS AMENDED  
(Submit 2 copies within 60 days  
of completion)

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN  
FINES AND/OR IMPRISONMENT.

NAME AND ADDRESS OF OWNER Kalium Chemicals Ltd. 1395 135th Avenue Hersey, MI 49639			TOWNSHIP Hersey		COUNTY Osceola
NAME AND ADDRESS OF DRILLING CONTRACTOR McLachlin Drilling Company PO Box 548 Evart, MI 49631			SUBSURFACE LOCATION (if directionally drilled) SW 1/4 of NW 1/4 of SW 1/4 Section 26 T17N R9W		
DATE DRILLING BEGAN 6/28/96	DATE DRILL COMPLETED 7/20/96	DATE WELL COMPLETED 7/23/96	FOOTAGES NORTH/SOUTH EAST/WEST 898 Ft. from North Line and 1319 Ft. from West Line of 1/4 Sec		
TOTAL DEPTH OF WELL Driller 7810 Log 7787	FORMATION AT T.D. A-1 Evap	PROD. FORMATION(S) A-1 Evap	FEET DRILLED -- CABLE TOOLS From N/A To		
DATE OF FIRST INJECTION T.B.A.	INJECTED FORMATION A-1 Evap	SOLUTION FORMATION A-1 Evap	FEET DRILLED -- ROTARY TOOLS From 0 To 7810		
			ELEVATIONS		
			K.B. 1151.3 ft. R.F. N/A ft. R.T. 1149.3 ft. Grd. 1137.3 ft		

## CASING, CASING LINERS AND CEMENTING, OPERATING STRINGS

## PERFORATIONS

SIZE	WHERE SET	CEMENT	FT. PULLED	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN
13 3/8	925	715 SKS	---				YES NC
9 5/8	5205	2675 SKS	---			None	
7	7755	575 SKS	---				

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)
None		None		None		None	Sam- ples Odor Pits Mud Line Gas Log. Fill Up

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	INTERVAL TREATED	MATERIALS AND AMOUNT USED	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	None	None	None				

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION

## DEVIATION SURVEY

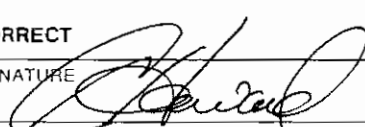
## PLUGGED BACK

BRAND	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTION	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	Digital Sonic	5100 - 7785			2700	1.0		X	
Recon Schl	X	GR-CAL	5100 - 7785			3654	16.5			
MW	X	Cement Bond	4886 - 7740		None	5121	14.3			
Scientific	X	Gyro	0 - 7800			7306	2.8			

## PRODUCTION TEST DATA

OIL -- Bbls/day	GRAVITY -- °API	COND Bbls/day	GAS -- MCF/day	WATER -- Bbls/day	H <sub>2</sub> S -- Grains/100 cu ft	B.H.P. AND DEPTH
N/A	N/A	N/A	N/A	N/A	N/A	N/A

I AM RESPONSIBLE FOR THIS REPORT THE INFORMATION IS COMPLETE AND CORRECT

DATE	NAME AND TITLE (PRINT)	SIGNATURE
9/4/96	Colin Howard, Production Geologist	

**FORMATION RECORD**  
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

ELEVATION USED 1151.3	GEOLOGIST NAME Colin Howard	TOPS TAKEN FROM <input checked="" type="checkbox"/> DRILLERS LOG <input type="checkbox"/> SAMPLE LOG <input type="checkbox"/> ELECTRIC LOG
--------------------------	--------------------------------	---

FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)	FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)
NOTE: IF WELL DIRECTIONALLY DRILLED, ADD TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE					
0	804	Drift			
804	1388	Michigan Group			
1388	1465	Triple Gyp			
1465	1577	Brown Lime			
1577	1694	Stray Sand			
1694	1860	Marshall Sand			
1860	2610	Coldwater Shale			
2610	2685	Sunbury Shale			
2685	3100	Ellsworth Shale			
3100	3264	Antrim Shale			
3264	3305	Traverse Formation			
3305	3809	Traverse Lime			
3809	3879	Bell Shale			
3879	3939	Dundee			
3939	3965	Reed City Anhydrite			
3965	4120	Reed City Dolomite			
4120	4193	Detroit Rive Anhydrite			
4193	4609	Detroit River Salt			
4609	4718	Detroit River Sour			
4718	5019	Massive Anhydrite			
5019	5134	Black Lime			
5134	5224	Sylvania			
5224	5378	Bois Blanc			
5378	5701	Bass Island			
5701	5708	Salina			
5708	5733	F-Unit			
5733	6298	F-Salt			
6298	6422	E-Unit			
6422	6462	D-Salt			
6462	6582	C-Shale			
6582	6924	B-Salt			
6924	7061	A-2 Carbonate			
7061	7409	A-2 Evaporite			
7409	7478	A-1 Carbonate			
7478	7810	A-1 Evaporite (T.D.)			
IF WELL WAS CORED, ATTACH CORE DESCRIPTION					
DRILL STEM TEST DATA					
None					
LIST ATTACHMENTS:					
Scientific - Gyro Survey Schl - GR - Caliper Schl - Digital Sonic M.W. - Cement Bond					
GEOLOGICAL SURVEY USE ONLY					
REVIEWED BY					
DATE OF REVIEW:					

6696

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING MICHIGAN 48909

**PERMIT TO**

☒ DRILL ☐ DEEPEN ☐ REWORK ☐ OPERATE

GRANTED UNDER PROVISIONS OF

☐ Act 61 P.A. 1939, as amended ☒ Act 315, P.A. 1969 as amended  
(M.C.L. 319.1 to 319.27) (M.C.L. 319.211 to 319.236)

Violation of and/or non-compliance with the provisions  
of the acts and conditions of permit may result in penalties.  
This permit includes as requirements all the operations and methods  
proposed by the applicant, unless rejected or altered by the DNR, and  
along with the attached stipulations are incorporated in its entirety by  
reference.

WELL NAME	WELL NO
KALIUM HERSEY	#2032

PERMIT M-408	ISSUED 3/07/96	TYPE OF WELL Natural Brine
CANCEL AND TRANSFER	ISSUED	FORMATION A-1 Evaporite
DEEPENING PERMIT		DEPTH 7880' MD - 7800' TVD
PERMIT EXPIRES 9/07/96		KIND OF TOOLS ROTARY
ISSUED TO KALIUM CHEMICALS, LTD. 1395 135th AVENUE HERSEY, MI 49639		

## LOCATION AND FOOTAGES:

SHL: SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Section 26, T17N, R09W, Hersey Township, Osceola County.

898 feet from North and 1319 feet from West Line of quarter section.

BHL: SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Section 26, T17N, R09W, Hersey Township, Osceola County.

1050 feet from the North and 580 feet from the West Line of Quarter Section.

O.D. SIZE	WT./FT.	CASING		CASING AND SEALING REQUIREMENTS			CEMENT	W.O.C. (HRS.)
		GRADE	CONDITION	DEPTH	SACKS			
11 3/4"	48#	J-55	New/Used	825'	625			16
9 5/8"	40#	K-55	New/Used	5200'	1800			16
7"	23#	L-80	New	7880'	300			24

1. No earthen reserve pit is to be dug. Steel tanks are to be used to contain drilling fluids and cuttings.
2. Cuttings shall be disposed of in a DEQ Class II landfill.

OFFICE TO BE NOTIFIED BEFORE DRILLING/DEEPENING STARTS

Cadillac District Office  
(616) 775-9727

BY

  
Rex Tefertiller

PERMIT COORDINATOR

PAGE 1 of PAGE(S)

(517) 334-5974

FOR THE SUPERVISOR OF WELLS/MINERAL WELLS

## THIS PERMIT IS SUBJECT TO THESE GENERAL CONDITIONS

- 1 Drilling operations shall not start until the drill site preparation requirements are completed.
- 2 Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all the terms and conditions of this permit and the rules, orders and requirements of the Supervisor of Wells/Mineral Wells.
- 3 The permittee is required to give notice to public utilities in accordance with Act 53, PA 1974 (M C L 460 701 to 460.718)
- 4 Any changes from what is stated in the permit application and permit shall be approved by the Supervisor of Wells/Mineral Wells
- 5 This permit is valid only for the permittee of issue and any change of ownership shall be accompanied by a request to the Supervisor of Wells/Mineral Wells to transfer the permit from the current owner to the new owner
- 6 NOTICE AND REQUIREMENTS FOR SOURCES OF WATER AND WATER WELLS USED IN CONJUNCTION WITH OIL AND GAS OR MINERAL WELL DRILLING AND OPERATIONS" December 1, 1984 is made part of and a condition of this permit.
- 7 During well completion and testing procedures all fluids shall be contained in tanks and transported to off site disposal facilities.
- 8 The Michigan Air Pollution Control Commission rules require that a person shall not install nor alter sour gas or oil well production equipment and flare unless a permit to install has been approved by the Commission. An operator is allowed to drill and test a sour well prior to obtaining the necessary permit to install from the Commission but is not allowed full production of such wells before issuance of the necessary air use permits
- 9 This permit does not convey property rights in either real estate or material or does it authorize any injury to private property or invasion of private or public rights or does it waive the necessity of seeking federal and local permits or complying with other state statutes.
- 10 If a Hydrogen Sulphide contingency plan is required a copy of PART II of the plan shall be posted in the primary briefing area
- 11 All trash and garbage shall be removed from the drill site at the completion of drilling.
- 12 Blowout preventers, accumulators, and pumps shall be certified as operable under the product manufacturer's minimum operational specifications. This certification shall include proper operation of the closing unit valving, pressure gauges, and manufacturer's recommended accumulatory fluids. Certification may be obtained through those companies presently used to test the blowout preventers stack and casing. Certification shall be required annually and shall be posted on the rig floor.
- 13 In addition to the primary closing system, including an accumulator system, the blowout preventers shall have a secondary system. A combination of any two of the following secondary closing systems will be acceptable: Electric-operated pump; Air-operated pump; Hand-operated pump or nitrogen. Extensions with hand wheels are not mandatory
- 14 Blowout preventer rams shall be of proper size for the drill pipe being used or production casing being run in the well. Variable type rams of the proper size range will be acceptable
- 15 The gas buster and flare system shall be in place and operable prior to drilling into a reservoir known or believed to contain Hydrogen Sulphide in excess of 500 ppm with the intention to complete in and/or test that reservoir
- 16 A trip tank, or any accurate fluid monitoring system, as well as a gas buster and flare system where justified, shall be in place when penetrating the A2 Carbonate formation. Changes may be granted by the Department of Natural Resources District Geologist.

# APPLICATION FOR PERMIT TO: ☒ DRILL ☐ DEEPEN ☐ REWORK OR ☐ OPERATE A WELL

MAIL TO:  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028 LANSING, MICHIGAN 48909

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION  
MAY RESULT IN FINES AND/OR IMPRISONMENT.

BY AUTHORITY OF:	
1a <input type="checkbox"/> Act 61, P.A. 1939 as amended	1b <input checked="" type="checkbox"/> Act 315, P.A. 1969, as amended
<input type="checkbox"/> Oil & Gas	<input type="checkbox"/> Disposal <input type="checkbox"/> Storage
<input type="checkbox"/> Brine Disposal	<input checked="" type="checkbox"/> Brine <input type="checkbox"/>
<input type="checkbox"/> Hydrocarbon Storage	<input type="checkbox"/> Test Well Type
<input type="checkbox"/> Secondary Recovery	<input checked="" type="checkbox"/> Single <input type="checkbox"/> Blanket

96076

2 Application to: (no fee required if permit is valid)	3 Fee enclosed:	4 Do prior permits exist?
<input type="checkbox"/> Deepen <input type="checkbox"/> Revise Application <input type="checkbox"/> Cancel and Transfer <input type="checkbox"/> Convert to <input type="checkbox"/>	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Drilled <input type="checkbox"/> Abandoned/Terminated

5 List each permit number	6 Fed. Employer Ident. No. or Soc. Security No.
	38-3545577
7 Surety Bond:	8 <input type="checkbox"/> Attached
<input checked="" type="checkbox"/> Blanket <input type="checkbox"/> Single Well	<input checked="" type="checkbox"/> On File
9 Bond No.	10 Bond Amount:
Bank of Montreal	\$25,000

11 Applicant: (name each "owner" as they are bonded)

**Kalium Chemicals, Ltd.**

12 Address: (operator only if more than one "owner") Phone:

1395 135th Avenue, Hersey, MI 49639 616-832-3755

13 Lease or well name: (be as brief as possible) Well number:

Kalium Hersey 2032

14 Surface owner:

**Kalium Chemicals, Ltd.**

15 Address: Phone:

1395 135th Avenue, Hersey, MI 49639 616-832-3755

16 Surface location (See instructions)	Township	County
SE 1/4 NW 1/4 of SW 1/4 of Sec. 26 T. 17N R. 9W	Hersey	Osceola

17 Bottom hole location if directional drill (See instructions)	Township	County
SW 1/4 NW 1/4 of SW 1/4 of Sec. 26 T. 17N R. 9W	Hersey	Osceola

18 LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT. (See instructions)

Surface	Location:	898	ft. from (N/S) North	Line of quarter section	AND	1319	ft. from (E/W) West	Line of quarter section
Bot Hole	Location:	1050	ft. from (N/S) North	Line of quarter section	AND	580	ft. from (E/W) West	Line of quarter section
Drilling	Unit:	N/A	ft. from (N/S)	Line of drilling unit.	AND		ft. from (E/W)	Line of drilling unit

19 Drilling contractor:	20 Kind of tools (Rotary cable combination)	21. Is sour oil or gas expected?	22. Blowout control diagram enclosed?
McLachlin Drilling	Rotary	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes

23 Blowout control (Detail equipment type size trim rating, testing choke manifold, etc See instructions)

See attached

24 intended Total Depth	25 Formation at Total Depth	26. Producing Formation	27. Objective Pool or Field
7880' MD	A-1 Evaporite	A-1 Evaporite	Hersey Potash

28 7880' MD PROPOSED DRILLING, CASING, CEMENTING AND SEALING PROGRAM

HOLE			CASING			CEMENT		MUO		
Depth	Geol. Form	Bit Dia.	O.D. Size	Wt./Ft. — Grade — Condition	Depth	Sacks	W.O.C.(hrs.)	Wt.	Vis.	W.L.
850	Drift	17 1/2"	13 3/8"	48#, J-55, New/Used	850	625	16	8.4	27	
5,200	Amhurstburg	12 1/4"	9 5/8"	40#, K-55, New/Used	5,200	1,800	16	10.2	27	
7,800	A-1 Evapor.	8 1/2"	7"	23#, L-80, New	7,800	300	24	10.2	34	2.6

29 Send correspondence and permit to: Address

**Kalium Chemicals, Ltd. 1395 135th Avenue, Hersey, MI 49639**

FOR DNR USE ONLY			30 Application Prepared By: (Print)	Phone:
Permit	Date Issued	Number	Colin D. Howard	616-832-3755
<input type="checkbox"/> Act 61			31. Signature:	Date:
<input checked="" type="checkbox"/> Act 315	3-7-96	M 408	<i>[Signature]</i>	FEB 8, 1996

FOR CASHIER'S USE ONLY DO NOT WRITE IN THIS SPACE

# APPLICATION FOR PERMIT TO: ☒ DRILL ☐ DEEPEN ☐ REWORK OR ☐ OPERATE A WELL

MAIL TO:  
MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028 LANSING MICHIGAN 48909

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION  
MAY RESULT IN FINES AND/OR IMPRISONMENT

96076

## BY AUTHORITY OF:

- |  |   |
|--|---|
| 1a <input type="checkbox"/> Act 61, P.A. 1939 as amended<br><input type="checkbox"/> Oil & Gas<br><input type="checkbox"/> Brine Disposal<br><input type="checkbox"/> Hydrocarbon Storage<br><input type="checkbox"/> Secondary Recovery | 1b <input checked="" type="checkbox"/> Act 315, P.A. 1969, as amended<br><input type="checkbox"/> Disposal <input type="checkbox"/> Storage<br><input checked="" type="checkbox"/> Brine <input type="checkbox"/><br><input type="checkbox"/> Test Well Type<br><input checked="" type="checkbox"/> Single <input type="checkbox"/> Blanket |
|--|---|

2 Application to: (no fee required if permit is valid)

☐ Deepen ☐ Revise Application ☐ Cancel and Transfer ☐ Convert to ☐

3 Fee enclosed:

☐ No ☒ Yes

4 Do prior permits exist?

☒ No ☐ Yes ☐ Drilled ☐ Abandoned/Terminated

5 List each permit number

6 Fed Employer Ident No or Soc Security No

38-3545577

7 Surety Bond:

8 ☐ Attached

9 Bond No.

10 Bond Amount:

☒ Blanket ☐ Single Well

☒ On File

Bank of Montreal

\$25,000

11 Applicant: (name each "owner" as they are bonded)

Kalium Chemicals, Ltd.

12 Address: (operator only if more than one "owner")

Phone:

1395 135th Avenue, Hersey, MI 49639

616-832-3755

13 Lease or well name: (be as brief as possible)

Well number:

Kalium Hersey

2032

14 Surface owner:

Kalium Chemicals, Ltd.

15 Address:

Phone:

1395 135th Avenue, Hersey, MI 49639

616-832-3755

16 Surface location (See instructions)

SE 1/4 NW 1/4 of SW 1/4 of Sec. 26 T. 17N R. 9W

Township

Hersey

County

Osceola

17 Bottom hole location if directional drill (See instructions)

SW 1/4 NW 1/4 of SW 1/4 of Sec. 26 T. 17N R. 9W

Township

Hersey

County

Osceola

18 LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT. (See instructions)

Surface Location: 898 ft from (N/S) North Line of quarter section AND 1319 ft from (E/W) West Line of quarter section

Bot Hole Location: 1050 ft from (N/S) North Line of quarter section AND 580 ft from (E/W) West Line of quarter section

Drilling Unit: N/A ft. from (N/S) Line of drilling unit. AND ft. from (E/W) Line of drilling unit

19 Drilling contractor:

McLachlin Drilling

20 Kind of tools (Rotary cable combination)

Rotary

21 Is sour oil or gas expected?

☐ No ☒ Yes

22 Blowout control diagram enclosed?

☐ No ☒ Yes

23 Blowout control (Detail equipment type size trim rating testing choke manifold etc See instructions)

See attached

24 Intended Total Depth

8,100 feet

25 Formation at Total Depth

A-1 Evaporite

26 Producing Formation

A-1 Evaporite

27 Objective Pool or Field

Hersey Potash

## 28 PROPOSED DRILLING, CASING, CEMENTING AND SEALING PROGRAM

HOLE			CASING			CEMENT		MUD		
Depth	Geol. Form	Bit Dia.	O.D. Size	Wt./Ft. — Grade — Condition	Depth	Sacks	W.O.C.(hrs.)	Wt.	Vis.	W.L.
850	Drift	17 1/2"	13 3/8"	48#, J-55, New/Used	850	625	16	8.4	27	
5,200	Amhurstburg	12 1/4"	9 5/8"	40#, K-55, New/Used	5,200	1,800	16	10.2	27	
8,100	A-1 Evapor.	8 1/2"	7"	23#, L-80, New	8,100	300	24	10.2	34	2.6

29 Send correspondence and permit to: Address

Kalium Chemicals, Ltd. 1395 135th Avenue, Hersey, MI 49639

FOR DNR USE ONLY

Permit	Date Issued	Number
<input type="checkbox"/> Act 61	3-7-96	M 418
<input type="checkbox"/> Act 315		

30 Application Prepared By: (Print)

Colin D. Howard

Phone:

616-832-3755

31 Signature

*Colin D. Howard*

Date:

FEB 8, 1996

FOR CASHIER'S USE ONLY DO NOT WRITE IN THIS SPACE


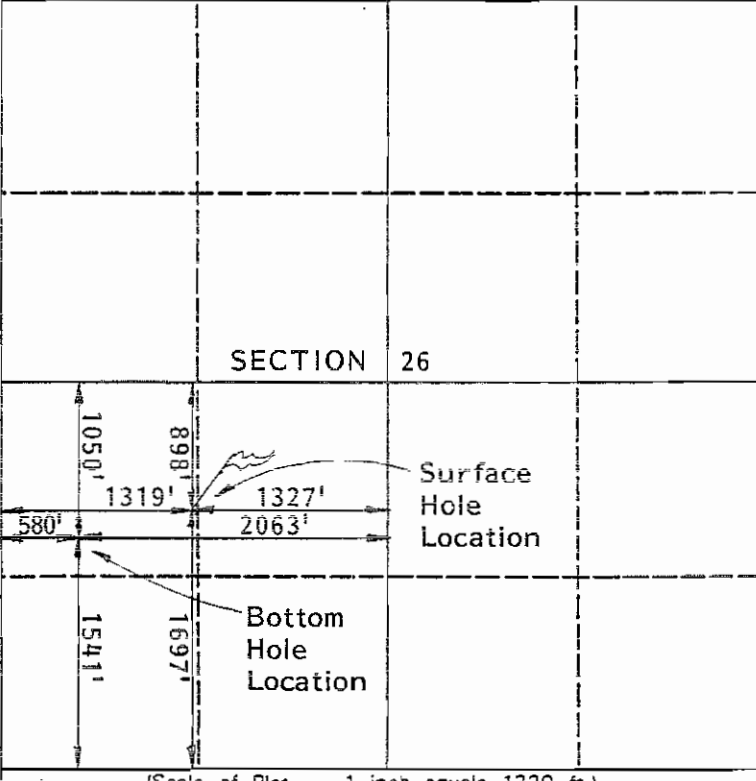
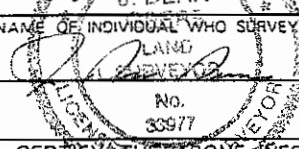
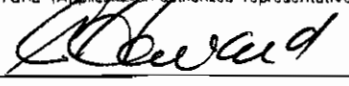
PR 7200-1  
Rev 10/85

NDNR76998-1 03/07/96  
71351 95003 5096 \$100.00 50.00

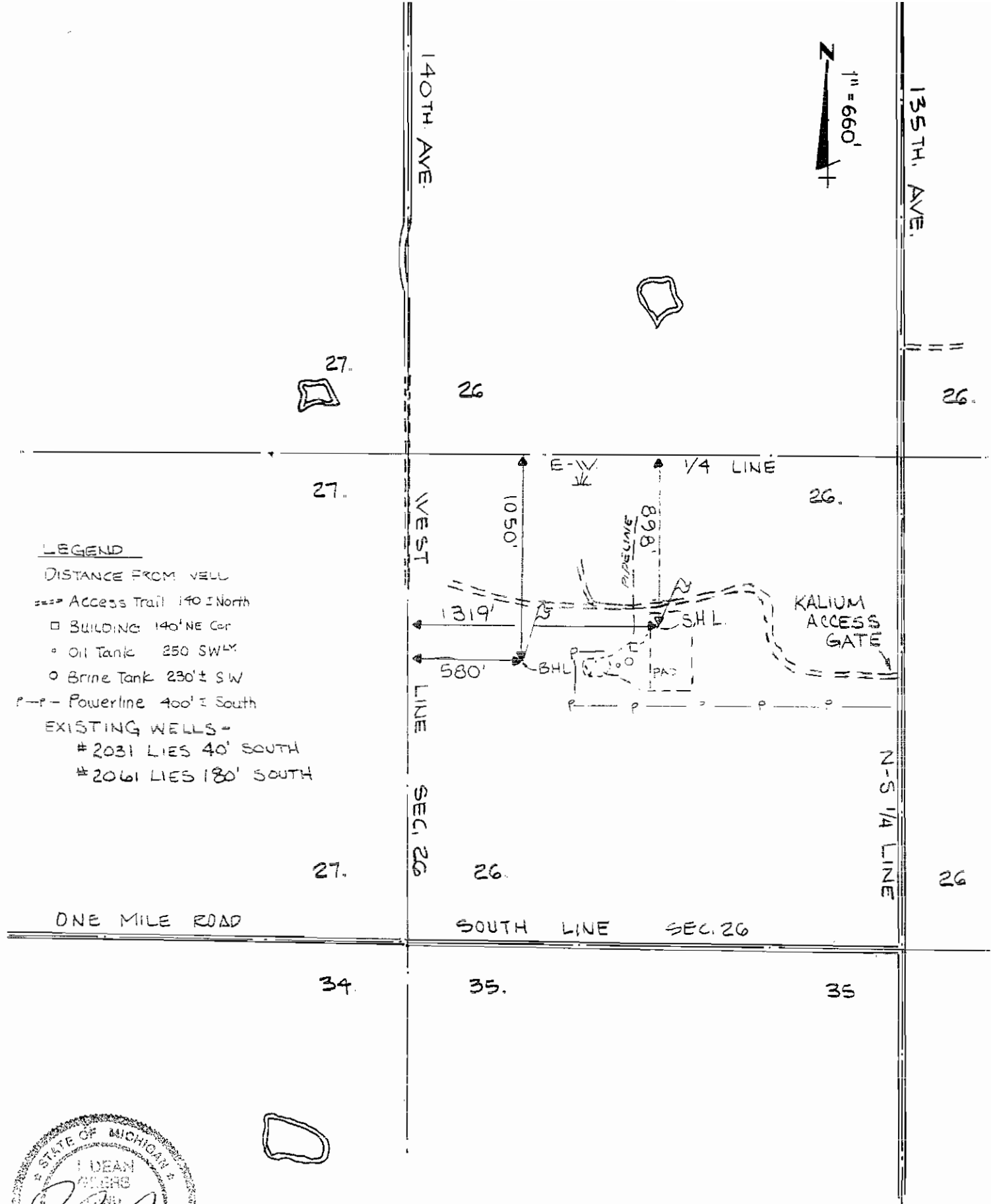
# SURVEY RECORD OF WELL LOCATION

Act 61, P.A. 1939, as amended. ~~XX~~ Act 315, P.A. 1969, as amended.  
Filing of Survey Record, Plat or Plot Plan and Environmental Impact Assessment with Application  
for Permit to Drill are REQUIRED by the above listed Acts. in order to obtain a Permit.

96076

APPLICANT <b>Kalium Chemicals, Ltd.</b>		WELL NAME AND NUMBER <b>Kalium Hersey 2032</b>	
SURFACE LOCATION <b>SE 1/4 of NW 1/4 of SW 1/4 of Section 26 T 17N R 9W Hersey</b>		COUNTY <b>Osceola</b>	
BOTTOM HOLE LOCATION <b>SW 1/4 of NW 1/4 of SW 1/4 of Section 26 T 17N R 9W Hersey</b>		COUNTY <b>Osceola</b>	
Instructions: Outline drilling unit and spot well location on Plat shown below (1). Where drilling unit crosses section lines, divide the Plat into an East half and a West half OR a North half and a South half (whichever applies). Outline the Unit and locate the well in two directions from NEAREST quarter section and unit lines (For Act 61, P.A. 1939 as amended).			
2. Location of well in two directions from NEAREST quarter section and unit lines is (For Act 61, P.A. 1939, as amended): Surface Location: <u>898</u> ft. from <u>North</u> line of Quarter Section (north-south) <u>1319</u> ft. from <u>West</u> line of Quarter Section (east-west) Bottom Hole Location: <u>1050</u> ft. from <u>North</u> line of Quarter Section (north-south) <u>580</u> ft. from <u>West</u> line of Quarter Section (east-west) Bottom Hole Will Be: <u>N/A</u> ft. from _____ line of unit/property (Act 315) lease (north-south) _____ ft. from _____ line of unit/property (Act 315) lease (east-west)		1. PLAT BELOW REPRESENTS ONE FULL SECTION (1 MILE SQUARE) N   SECTION 26 Surface Hole Location Bottom Hole Location (Scale of Plat — 1 inch equals 1320 ft.)	
3a. Describe wellsite marker. Show or describe access route if it is not readily accessible <u>Wellsite is marked with a painted wood stake</u> <u>Site can be reached from the intersection of</u> <u>135th Ave. and 1 Mile Rd., then North on</u> <u>135th Ave. .25-.3 miles to Kalium Access</u> <u>Gate, then see Supplemental Plat.</u>			
3b. Zoning <input type="checkbox"/> Residential <input type="checkbox"/> Other: <u>None in effect</u>			
3c. Effective date: _____			
4. ON SEPARATE PLAT OR PLOT PLAN. LOCATE, IDENTIFY AND SHOW DISTANCES TO: A. All roads, power lines, residences, farm buildings, and other structures within 300 feet of the stake. B. All lakes, streams, swamps, drainage-ways or any other surface water features within 1320 feet of the stake.			
5. In an ENVIRONMENTAL IMPACT ASSESSMENT describe all structures and surface features shown detailing plans for hazards prevention and erosion control. (See instructions and guidelines for preparation of an environmental impact assessment).			
NAME OF INDIVIDUAL WHO SURVEYED SITE  J. DEAN		DATE <b>2-5-96</b>	
TITLE <b>Professional Surveyor</b>		PS# <b>339777</b>	
WILCOX ASSOCIATES, INC. 7711 S US-131, Cadillac, MI 49601			
I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.			
SIGNATURE (Applicant or authorized representative) 		DATE (Month, Day, Year) <b>2/8/96</b>	





SUPPLEMENTAL PLAT- KALIUM  
 HERSEY 2032. SECTION 26, T17N, R9W  
 HERSEY TOWNSHIP.  
 OSCEOLA COUNTY MICHIGAN.  
 CLIENT: KALIUM CHEMICALS, LTD.

DATE  
 2-1-96  
 ORN  
 H.A.W.  
 CHD  
 JDG  
 SCALE  
 V: 1"=660  
 H: 1"=660

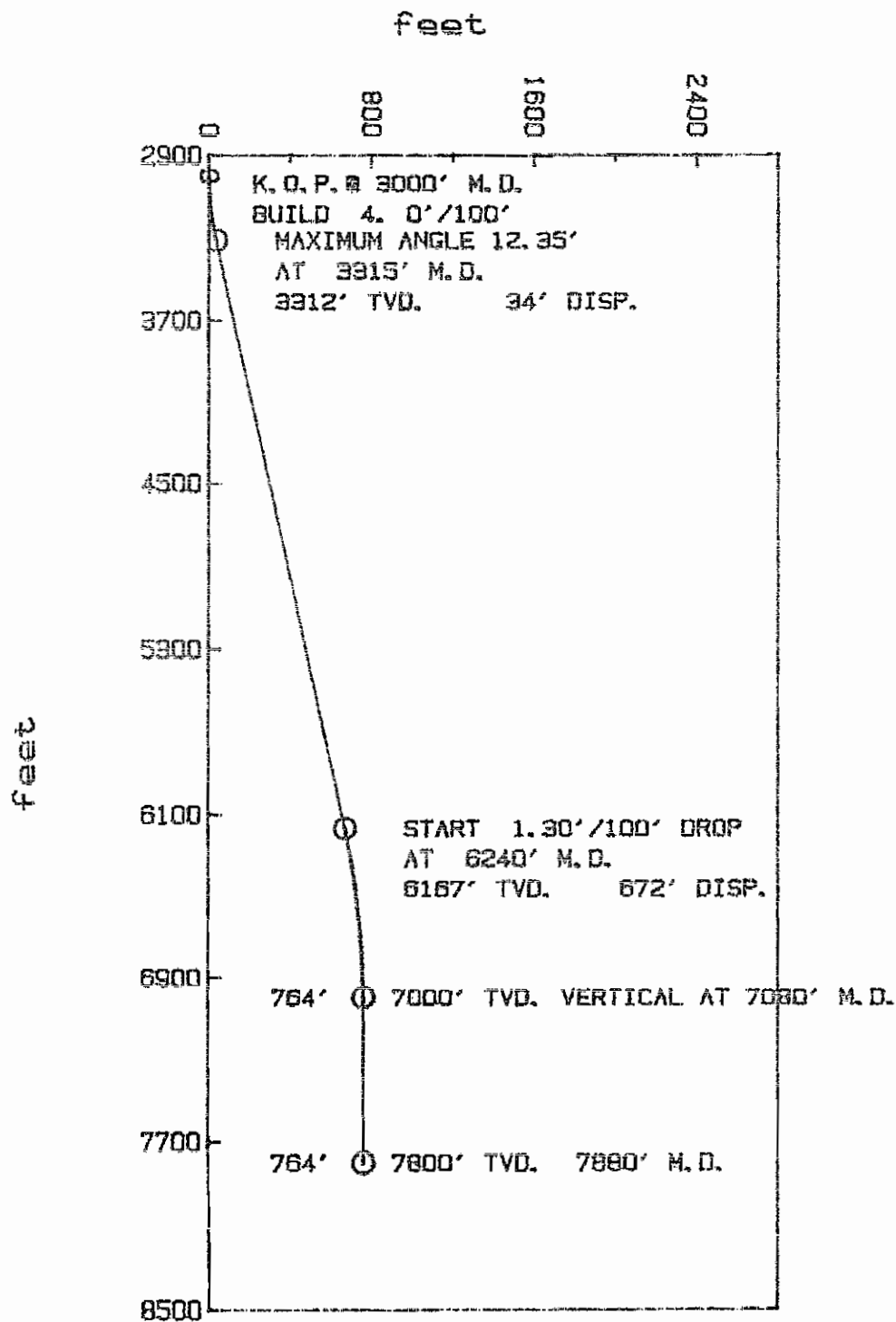
**Wilcox Associates**  
 Engineering  
 Surveying and  
 Environmental  
 Sciences  
 P.O. Box 580  
 7711 South US 131  
 Cadillac, MI 49601  
 616 775-7755

NOTES  
 SHEET  
 1 OF 1  
 JOB NO  
 96076

2032

KALIUM CHEMICAL  
KALIUM-HERSEY WELL # 2032  
HERSEY TOWNSHIP , OSCEOLA CO.

VERTICAL SECTION 1 IN. = 800 FT.



2032

KALIUM CHEMICAL

KALIUM-HERSEY WELL # 2032  
HERSEY TOWNSHIP , OSCEOLA CO.

OBJECTIVE NO. 1:

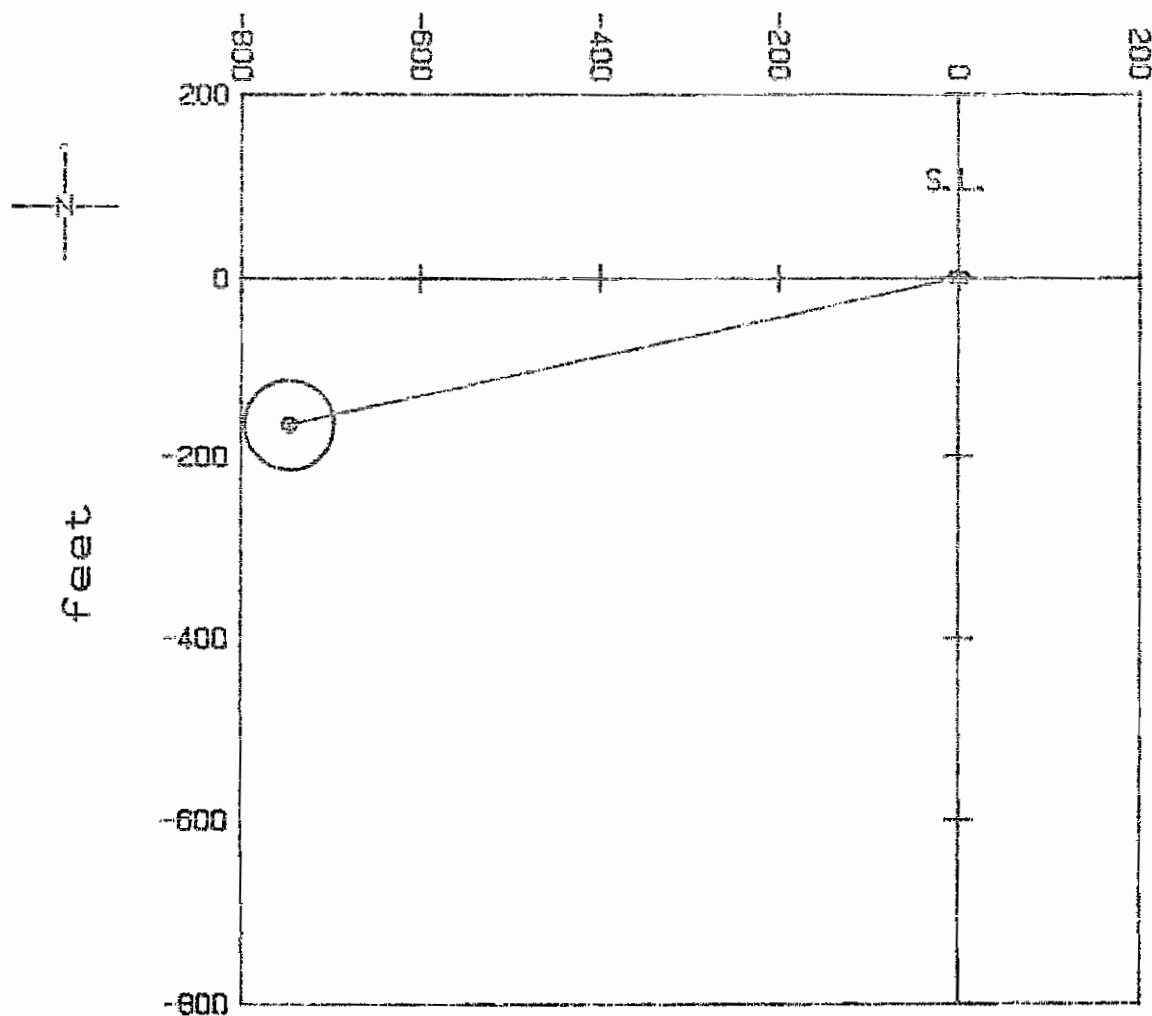
764' S77.32' W OF  
SURFACE LOCATION  
7080' M. D. 7000' TVD.  
165' SOUTH 746' WESTPLAN VIEW  
1 IN. = 200 FT.

OBJECTIVE NO. 2:

764' S77.32' W OF  
SURFACE LOCATION  
7880' M. D. 7800' TVD.

SUBMITTED BY:

Directional Drilling Contractors, Inc.

50' RADIUS TARGET  
feet



**Kalium Chemicals** 1395 135th Avenue  
Hersey, Michigan 49639 Telephone: (616) 832-3755 Fax: (616) 832-3349

February 6, 1996

Mr. William R. Lee  
Permit Coordinator  
Permits and Bonding Unit  
Geological Survey Division  
Department of Natural Resources  
P. O. Box 30256  
Lansing, MI 48909

Dear Sir:

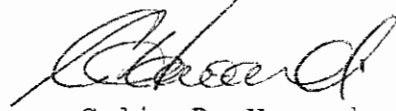
RE: Casing and Cementing Procedures for  
Kalium Hersey 2032

1. Conductor pipe of 30 inch diameter will be driven to refusal in this well. Surface hole will be drilled with a 17-1/2" bit 100 feet into the competent rocks of the Michigan Group at a depth of approximately 850 feet. New or fully inspected used, 13-3/8 inch, 48 #/foot, J55 casing will be run to bottom with a Texas pattern shoe. The bottom three joints of casing will be strapped across the collars in three sections. The casing will be cemented with returns to surface. Wait on cement time will be 16 hours.
2. The 12-1/4 inch intermediate hole will be drilled directionally to the Amherstberg Formation (Black lime) at a depth of approximately 5250 feet (5100 feet T.V.D.) as local drilling shows no lost circulation zones deeper. Intermediate casing, new or fully inspected used, 9-5/8 inch, 40 #/foot, J-55 or K-55 casing, will be set at this depth and two stage cemented to surface as per cementers recommendations in line with accepted cementing practices.
3. The 8-1/2 inch production hole will be drilled into the A-1 Evaporite at a depth of approximately 8000 feet (7800 feet T.V.D.). The primary objective of this well is the evaluation and production of the potash mineralization of the A-1 Evaporite. The evaluation program will consist of coring the mineralized section of the A-1 Evaporite and appropriate geophysical logs. Production casing will be new 7 inch, 23 #/foot, L-80 seamless casing set in the A-1 Evaporite and cemented back to 5500 feet with premium cement.

cdhl9

4. After the well operations have ceased, it will be plugged and abandoned according to Department of Natural Resources requirements.

Yours truly,

A handwritten signature in dark ink, appearing to read 'Colin D. Howard', written in a cursive style.

Colin D. Howard  
Production Geologist

cc: Robert E. Thompson  
William E. Booker, Acting Cadillac District Geologist

STATE OF MICHIGAN  
MINERAL WELL OPERATORS  
ENVIRONMENTAL IMPACT ASSESSMENT

**Well Identification**

Name and Address of Applicant:	<b>Kalium Chemicals, Ltd.</b> 1395 135th Avenue Hersey, MI 49639
Well Name and Number:	<b>Kalium Hersey 2032</b>
Surface Location:	SE 1/4 of NW 1/4 of SW 1/4
Bottom Location:	SW 1/4 of NW 1/4 of SW 1/4 Section 26, T17N, R9W Hersey Twp , Osceola Co , MI

**I. Description of Project**

A development well is to be directionally drilled from a surface location 898 feet from the North line and 1,319 feet from the West line of the Southwest 1/4 of Section 26, T17N, R9W, to a bottom hole location 1050 feet from the North line and 580 feet from the West line of the same Southwest 1/4 of Section 26, T17N, R9W. The well will be drilled to a total anticipated vertical depth of 8,100 feet for the evaluation and production of sodium and potassium mineralization through the Niagaran Formation, with total depth in the A-1 Evaporite Formation. The well is located in the Southwest 1/4 of Section 26, T17N, R9W, Hersey Township, Osceola County, Michigan. Surface and mineral rights for the entire Southwest 1/4 of Section 26 are in private ownership and all concerned parties have been informed of the proposed well location and advised of our intentions to complete an application for a permit to drill this mineral well.

The proposed well is part of a project involving several other wells. All wells will be drilled from a common drilling pad area. This well will be located on an existing pad, 40 feet north of existing well #2031, and no earthwork will be required for pad preparation. The land surrounding the wellsite is rolling, open, dormant field. Land use in the surrounding area is mixed agricultural and forest recreational. There are no lakes, swamps or principal streams within 1/4 mile of the wellsite. Natural drainage at the site was to the Northwest toward Polick Creek, which is part of the Muskegon River watershed. However, all drainage from the drill pad now drains to a lined containment pond and is not allowed to enter the natural drainage system.

There is an existing brine tank located approximately 230 feet Southwest, an oil tank located approximately 250 feet West, a building located approximately 140 feet Southwest, and a powerline located approximately 400 feet South, and 440 feet West of the proposed wellsite.

Access to the location will be from the North, off of an existing Kalium Chemicals, Ltd. road. This road originates at 135th Avenue, an all-season bituminous surfaced County road running along the North-South 1/4 line of Section 26. There will be no new access trail needed for this project. Emergency access is also available from the West off of 140th Avenue, a gravel surfaced County road located along the West line of Section 26.

## **II. Environmental Impact Assessment**

The drilling of the well at this location should have only a minor effect on the ecological system of the vicinity. Wildlife is abundant throughout the region, but no special or endangered species are known to exist in the vicinity of the proposed project. The proposed project should have only a slight effect on future population patterns.

The proposed project is for further development and production for solution mining operation purposes. A 7 inch casing will be set to the A-1 Evaporite and cemented back to 5,500 feet, below the intermediate casing in this solution mining well.

A minimal disruption to the environment will result by locating this well in the area of previous drilling. A total area of approximately 4 acres has previously been prepared for drilling and containment purposes. There will be no tree removal or earthwork needed as this well will be located on an existing pad. Appropriate drill site drainage and sedimentation control measures have been incorporated in the operational plan. We have not experienced any unusual erosional problems at this location.

Due to environmental considerations, Kalium Chemicals, Ltd. does not plan to use conventional reserve pits. The well will be drilled using a pit liner sealed around the rig base, cellar, rathole, and mousehole for containment of fluids. The following special measures will be taken in the handling of drilling solids and fluids. The drilling fluids will be circulated through closed-looped working pits. The solids control in the drilling fluid will be handled through a special flocculent and centrifuge system to provide effective separation of the brine from the drill cuttings. Brine will be disposed of in an approved disposal well. The semi-dry drill cuttings will be temporarily stored on an impervious barrier at the drilling location. The barrier will be sloped such that any leachate will collect at a central location to allow easy recovery and subsequent disposal in a disposal well. The volume of the containment area, including its side-dikes, will be able to hold several days worth of precipitation, in addition to holding the drilling cuttings expected from the wells. Final disposition of the cuttings will be at an approved landfill site.

Access to the wellsite will be from the North off of an existing access trail originating off of 135th Avenue. Emergency access is also available from the West off 140th Avenue. No new access trail will need to be constructed.

Although other wells at this location have not encountered significant concentrations of hydrogen sulfide gas, intentions are to proceed as if that possibility does exist. Appropriate safety measures will be taken. In general, the Administrative Rules for the Management of Hydrogen Sulfide, effective September 2, 1987, prepared by the Geological Survey Division, will be observed. The site is well isolated from human habitation. There are no residences within 1/4 mile of the wellsite.

An existing water supply well that had been used for previous drilling on this pad has now been abandoned. Therefore, water needed for the drilling of this well will be trucked onto the site.

Upon completion of drilling and producing operations the well will be plugged in accordance with Michigan Department of Environmental Quality instructions prior to abandonment. When no longer needed, the drilling pad area will be fine graded, stabilized, and restored, as nearly as possible, to its original condition. This project is expected to have only a slight effect on the immediate environment.

### **III. Possible Alternatives to the Proposed Well Location**

The proposed location has been selected on the basis of a geologic interpretation and an extensive on-site evaluation. By drilling this well from a common drilling pad with others, a minimal disruption of the environment will result. Preparation of the drilling pad will not require additional tree removal. No new access trail will be required. The proposed project area is well isolated from surface waters and from human habitation. We believe the site is generally well suited for the undertaking of this project and that adequate protection of the environment can be maintained at this location. For these reasons, we believe that drilling the well from the surface location proposed is the best available alternative.

### **IV. Any Irreversible and Irretrievable Commitment of Resources**

The proposed project should not require a significant commitment of natural resources. The productivity of the land utilized for the drilling pad and access road will be lost during the life of the project, but the surface resources of the drill site will not be irreversibly committed. Drilling of the well will not curtail the use of the surrounding environment.

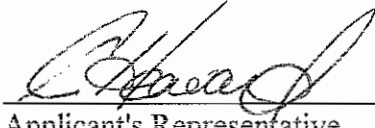
### **V. Summary**

In order to minimize surface disturbances, this development well is to be drilled from a common surface location which has been used for other wells in this 1/4 section. The total surface area necessary for this project encompasses approximately 4 acres. The drilling pad is located on



rolling, generally open land. The drill site and the surrounding 4 acres are a part of the commercial potash solution mining facility operated by Kalium Chemicals. Land use in the surrounding area is mixed agricultural and forest recreational. Natural drainage from the location is Northwesterly toward a tributary of the Muskegon River. There are no lakes, swamps or principal streams within 1/4 mile of the proposed wellsite. Appropriate drill site drainage and sedimentation control measures have been included in the operational plan. Although it is not anticipated that sour gas will be encountered at this location, the intention is to proceed as if the possibility exists. Access to the wellsite will be from the North off of an existing access trail originating at 135th Avenue. Emergency access is also available from the West off of 140th Avenue. We consider the environmental impact of this project to be minimal, and will make every effort to insure protection and preservation of the environment during the course of our drilling and producing operations.

Provision has been made to run ground elevation, to sea level datum, for the proposed location. This will be performed by a Professional Surveyor within 14 days after the well has been spudded and filed with the Supervisor of Wells.

  
\_\_\_\_\_  
Applicant's Representative

Comments by Department of Natural Resources Representative:

\_\_\_\_\_  
Authorized Representative

# WELLHEAD BLOWOUT CONTROL SYSTEM

Optional worksheet supplement for Application For Permit to Drill/ Deepen  
Rework or Operate a Well By Authority of Act 61 P.A. 1939 as  
amended or Act 315 P.A. 1969 as amended

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

Box 30028  
Lansing, Michigan 48909

96076

COMPANY

Kalium Chemicals, Ltd.

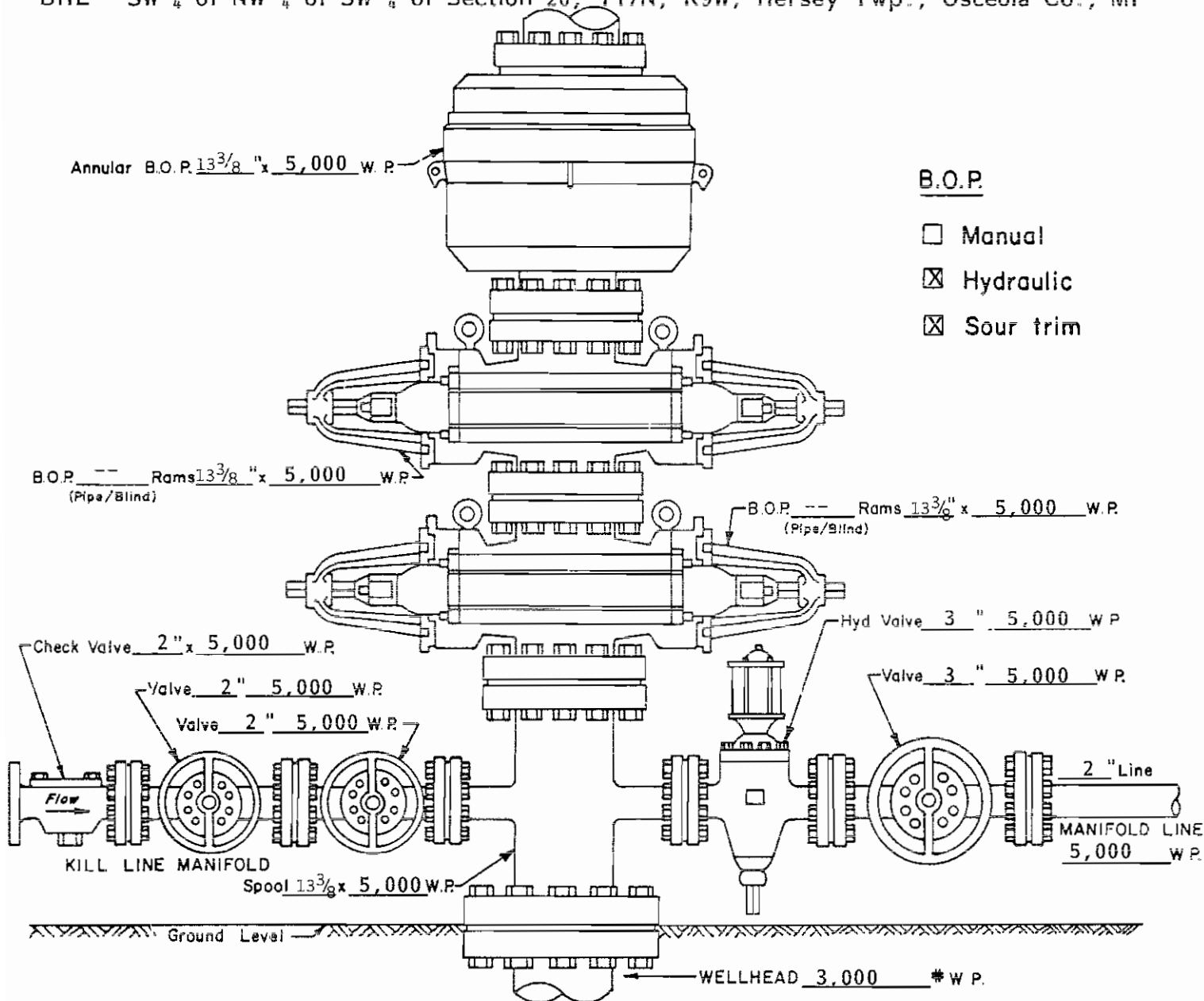
WELL NAME AND NUMBER

Kalium Hersey 2032

LOCATION

SHL - SE  $\frac{1}{4}$  of NW  $\frac{1}{4}$  of SW  $\frac{1}{4}$  of Section 26, T17N, R9W, Hersey Twp., Osceola Co., MI

BHL - SW  $\frac{1}{4}$  of NW  $\frac{1}{4}$  of SW  $\frac{1}{4}$  of Section 26, T17N, R9W, Hersey Twp., Osceola Co., MI



B.O.P.

☐ Manual

☒ Hydraulic

☒ Sour trim

Fill blanks with applicable information. If not applicable, enter "N.A." or cross-out item shown. Enter other pertinent information below.

This BOP system to be used on surface casing while drilling to intermediate casing.

SOUR GAS CONTINGENCY PLAN - PART II  
KALIUM HERSEY 2032  
SECTION 26, T17N, R9W,  
HERSEY TOWNSHIP, OSCEOLA COUNTY, MICHIGAN

RESIDENTS WITHIN 1/4 MILE OF WELLSITE

None

EMERGENCY TELEPHONE NUMBERS

<u>Name</u>	<u>Location</u>	<u>Number</u>
Company Personnel		
Colin Howard	Hersey, MI (Office)	616-832-3755
Kyle Barbot	Hersey, MI (Office)	616-832-3755
Don Purvis	Hersey, MI (Office)	616-832-3755
MDNR		
Hal Fitch	Cadillac, MI	616-775-9727
Raymond Vugrinovich	Lansing (Office) (Home)	517-334-6951 517-339-9547
Sheriff	Osceola County	911 or 616-832-2288
State Police	Reed City, MI	911 or 616-832-2221
Ambulance	Osceola County	911
Hospital	Reed City Hospital (N Patterson Road) 7665 S 220th Avenue Reed City, MI 49677	616-832-3271
Fire Department	Hersey, MI	911 or 616-832-3255

Director of Emergency Services  
Dallas Jenks

Osceola Co (Office)  
(Emergency)

616-832-6172  
911

Pollution Emergency Alerting System (PEAS)

800-292-4706

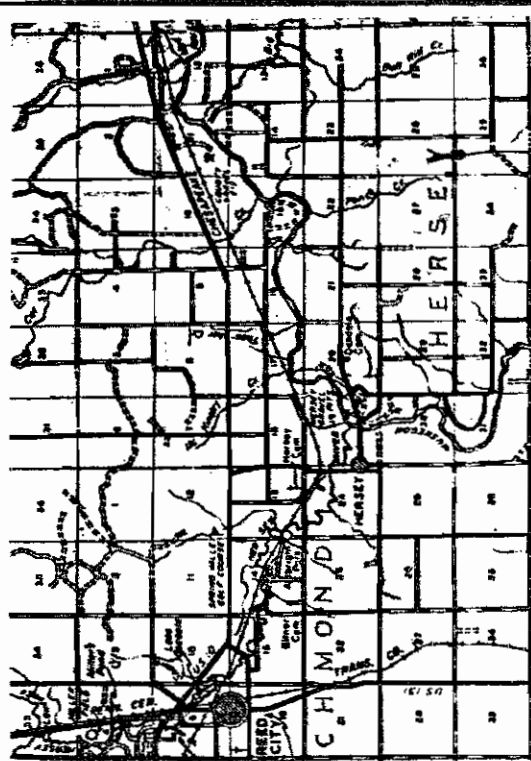
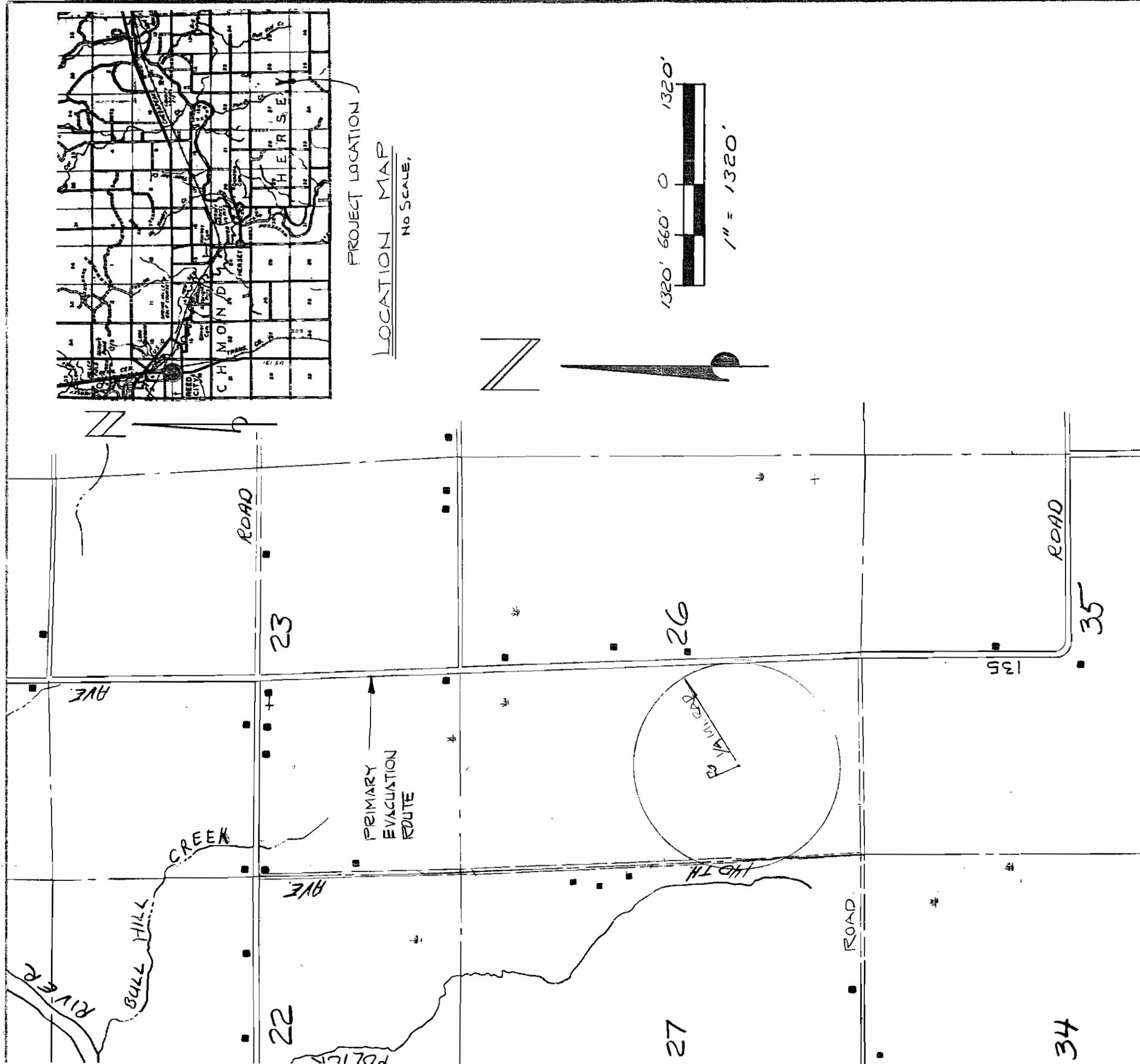
#### NEAREST PUBLIC TELEPHONE

The nearest public telephone is located in front of the General Store in the town of Hersey. It is located North 1/2 mile on 140th Avenue, then West 4 miles on Hersey Road to the general store in the town of Hersey, on 180th Avenue.

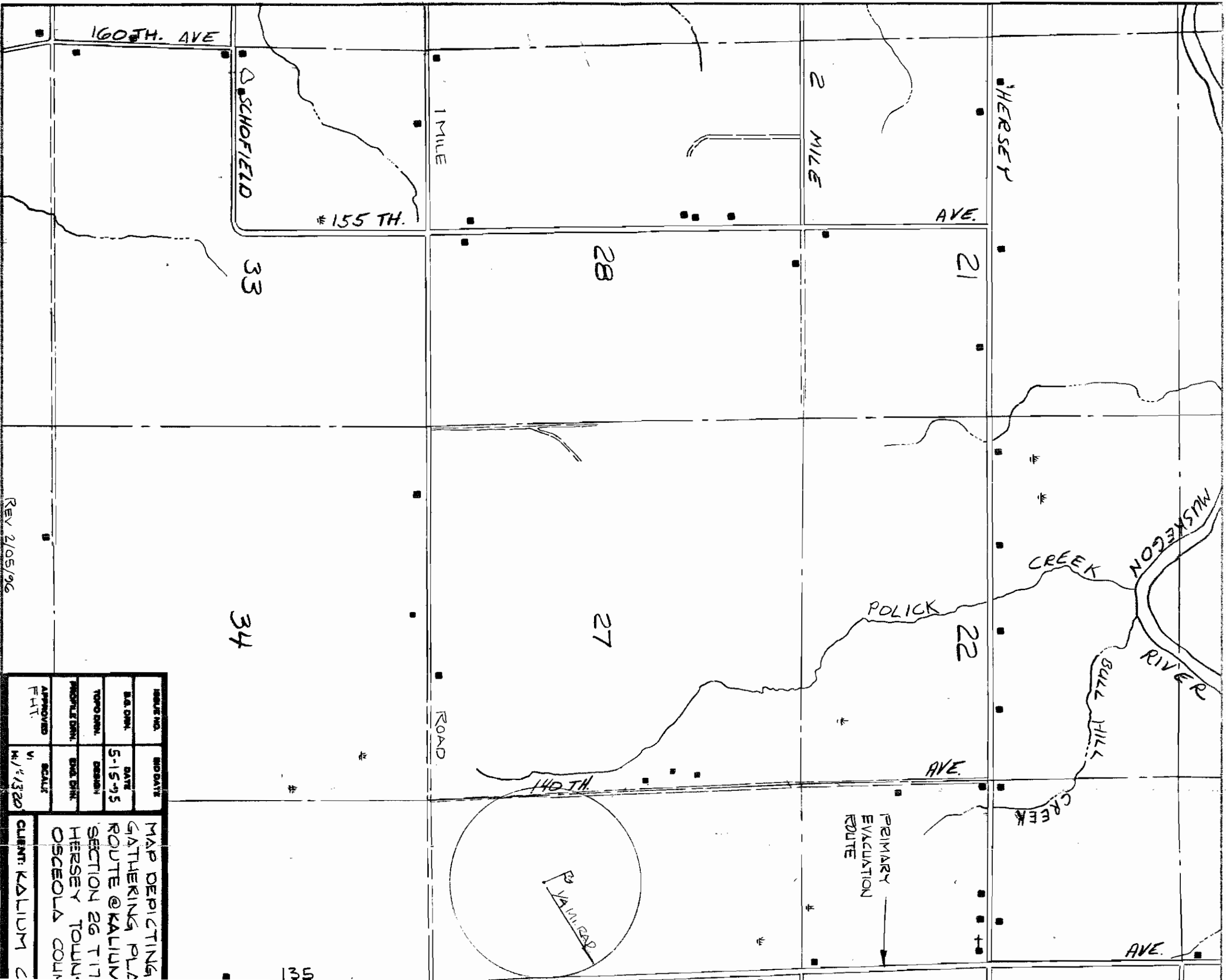
#### MUD TREATMENT

A gas buster will be provided.

NOTE: For location of residences, public gathering places and evacuation routes, see vicinity map.



SHEET 1 OF 1		JOB NO. 96076	
<b>Wilcox Associates, Inc.</b>			
7711 South U.S. 131 P. O. Box 580 Cadillac, MI 49801 816 775-7755			
MAP DEPICTING RESIDENCES, PUBLIC GATHERING PLACES AND EVACUATION ROUTE @ KALIAM HERSEY # 2032. SECTION 26 T17N, R20W, HERSEY TOWNSHIP, OSCEOLA COUNTY, MICHIGAN			
CLIENT: KALIAM CHEMICALS, LTD.			
ISSUE NO.	END DATE	DATE	SCALE
S.G. DRL	5-15-95	DESIGN	V. 14/1320
TOPO DRL		END DRL	
APPROVED F.H.T.			



ROUTE NO.	END DATE
160TH	5-15-95
TOPO DATA	DESIGN
PROFILE DATA	DATA DATA
APPROVED	SCALE
FMT	1/1/1320

MAP DEPICTING  
GATHERING PLZ  
ROUTE @ KALIBUM  
SECTION 26 T117  
HERSEY TOWN  
OSCEOLA COUN  
CLIENT: KALIBUM C



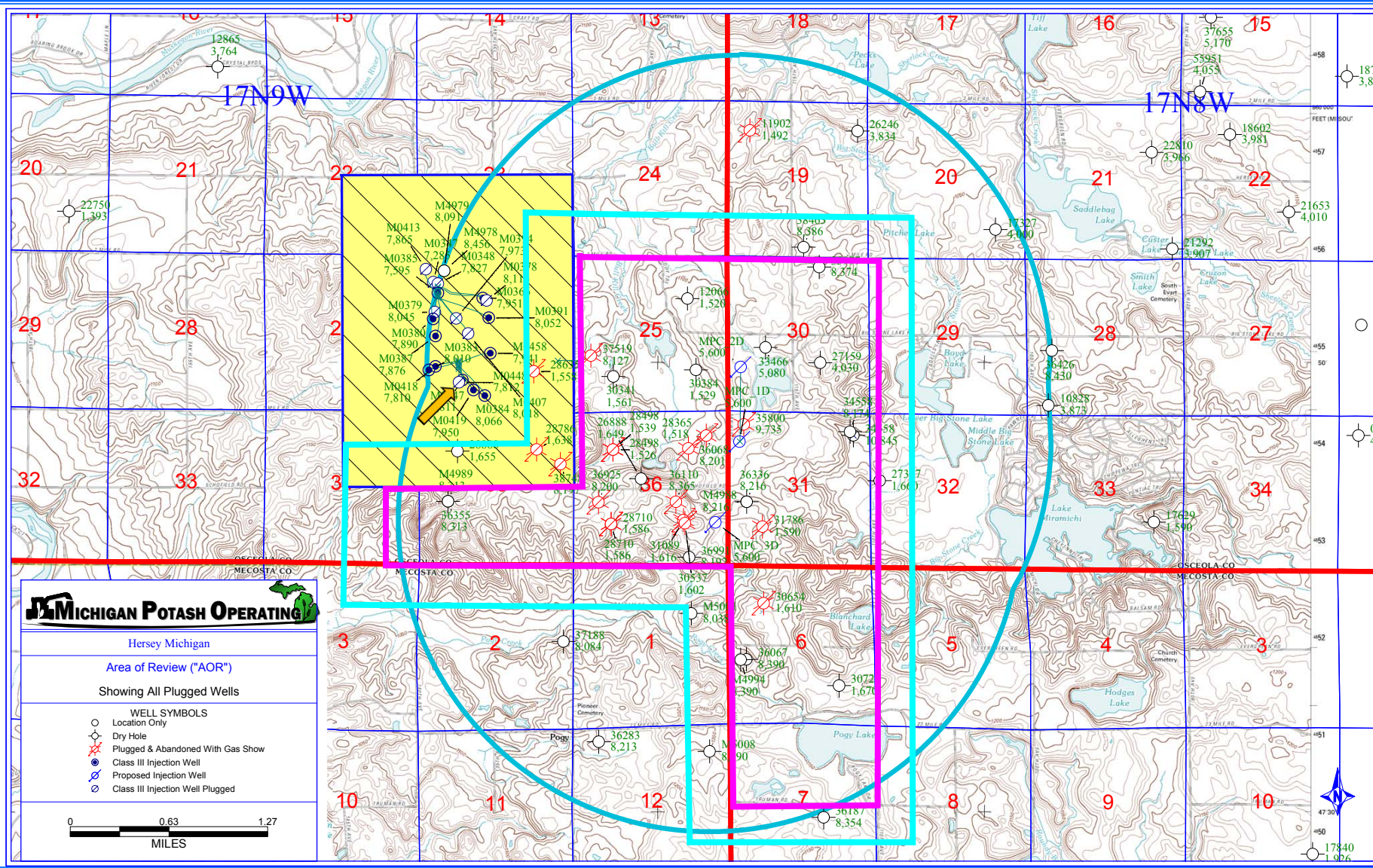


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**KALIUM 2082**  
SE NW SW Sec 26 T17N R9W  
OSCEOLA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

PERMIT No. 00438  
API No. 21-133-00438-70-00  
GL @ 1135.6'  
KB @ 1149.5'  
WELL COMPLETION DATE: 10/26/1997  
PLUGGING COMPLETION DATE:

UPDATED APRIL 2014 BY JLT

3877'-3944' TVD DUNDEE  
3944'-3973' TVD REED CITY ANHYDRITE  
3973'-4124' TVD REED CITY DOLOMITE

7480'-7750' TVD A-1 EVAP

TD @ 7812' KB

30" CONDUCTOR DRIVEN TO 90'

**SURFACE CASING**

13 3/8", 48#/ft  
SET @ 893' KB  
900 SX CLASS A

17-1/2" Hole

**INTERMEDIATE CASING**

9-5/8", 40#/ft  
SET @ 5139' KB  
2425 SX CLASS A

12-1/4" Hole

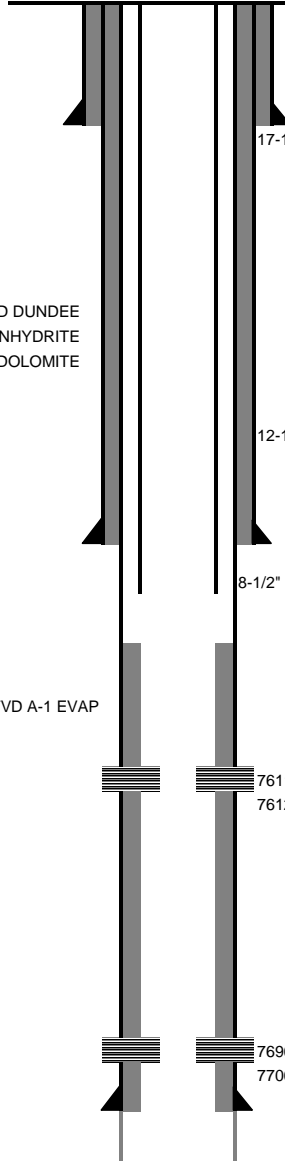
**PROD. CASING**

7", 23#/ft  
SET @ 7715' KB  
680 SX CLASS H

8-1/2" Hole

7611'-7615'  
7612'-7624'

7696'-7702'  
7706'-7704'





**KALIUM 2082 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
9/21/1997	SPUD.
10/22/1997	DRILLING COMPLETED.
	13 3/8" SET AT 925'; 715 SX CLASS A 9 5/8" SET AT 5205'; 2675 SX CLASS A 7" SET AT 7755'; 575 SX CLASS H
10/26/1997	WELL COMPLETED.
11/10/2007	WELL CASING REPAIR STARTED
12/5/2007	WELL CASING REPAIR COMPLETED. 4-1/2" CASING RUN TO 6000'.
8/31/2009?	LOST MECHANICAL INTEGRITY. PULL 4-1/2" CASING. RAN WIRLINE SET BRIDGE AND SAT DOWN AT 5703'. RAN 6" STRING MILL AND TRIED TO CLEAN OUT 7" CASING. COULD NOT GET BY 5703'. RAN 6" FLAT BOTTOM MILL AND TRIED MILLING THROUGH. COULD NOT GET BY 5703'. RAN 1-11/16" CCL. LOGGED FROM 5650'-5800'. APPEARS TO BE DAMAGED FROM 5703'-5714'. RAN 3-1/8" CCL AND COULD NOT GET BY 5703'. RAN 5-1/2" IMPRESSION BLOCK AND SAT DOWN AT 5703'. ONLY MARKS ON THE OUTSIDE OF THE BLOCK. REQUEST SETTING A BRIDGE PLUG @ 5675' AND P & A WELL.



## MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

## APPLICATION TO:

- ☐ CHANGE WELL STATUS OR  
☒ PLUG AND ABANDON WELL

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment

☐ Part 615 Oil or Gas Well ☒ Part 625 Mineral Well

## Change of well status requested to:

- ☒ Plug back ☐ Perforate ☐ Temporarily abandon  
☐ Convert to ☐ Other

## Last production/injection rate and type of fluid

8/31/2009 300/GPM Brine Water

## Brief description of project

Set bridge plug @ 5675' Set 100 Sack Class A plug on top of bridge plug Continue plugging to 4741' Cut and pull 7" casing and then plug to surface.

## Work to be done by

Mosaic Potash Hersey

## Permit number

438

## Type of well

Solution Mining

## API number

MI-133-3G-A002

## Name and address of permittee

Mosaic Potash Hersey  
1395 135<sup>th</sup> Ave

Hersey, MI

## Well name and number

Kalium 2082 (Mosaic Potash)

## Well location

SE 1/4 of NW 1/4 of NW 1/4 Section 26 T 17N R 9W

## Township

Hersey

## County

Osceola

## Date drilling completed

1998

## Date last produced/utilized

8/31/2009

## Starting date

11/1/2010

## CASING AND CEMENTING RECORD

Hole dia	Casing dia & wt/ft	Depths set	Cement quantity, type, additives	Cement top	Perforations
30"	30"	90'	Driven		
17 1/2"	13/3/8"	893'	900 Sacks Lite/A	Surface	
12 1/4"	9 5/8"	5139'	2425 Sacks Lite/A	Surface	
8 1/2"	7"	7715'	680 Sacks Poz/H	4950'	7612'-7624'

## Formation record (formation and depth of top, oil, gas and water shows, etc.):

formation depth

## Detail proposed procedures:

Set CIBP @ 5675' Set 100 Sack Class A plug on top of the bridge plug. Set 75 Sack Class A plug @ 5147'. Cut and pull 7" casing from 4741' to surface Set 180 Sack 50/50 Poz plugs every 500' from 4741' to 300' Set 108 Sack Class A plug from 300' to surface. Make certain of cement to surface and cut and cap 9 5/8" stub

**RECEIVED**

OCT 26 2010

DNRE / ERMD  
OFFICE OF GEOLOGICAL SURVEY

Name/signature (authorized representative):

*William C. Hicks*

Date:

10/18/2010

## FOR OFFICE OF GEOLOGICAL SURVEY USE ONLY

## DEQ additional requirements:

**NOTIFY MARK SMITH (231 876 4434) AND RAY VUGRINOVICH (517 241 1532) AT LEAST 48 HOURS BEFORE PLUGGING BEGINS.**

☐ Yes ☐ No ☒ Not applicable Production tests to commence within 10 days of completion and to be filed

☒ Yes ☐ No Service company records are to be filed

Approved by DEQ:

*Raymond Vugrinovich*

Office:

LANSING

Approval date:

11/9/2010

Termination Date:

11/9/2011

Submit original and three (3) copies of this application to the District Office within 60 days of change of well status  
Note: Three copies of Record of Well Plugging or Change of Well status (EQP 7200-8) and any requested service company records are to be filed within 60 days of completion at the District Office

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D C. 20460

## PLUGGING AND ABANDONMENT PLAN

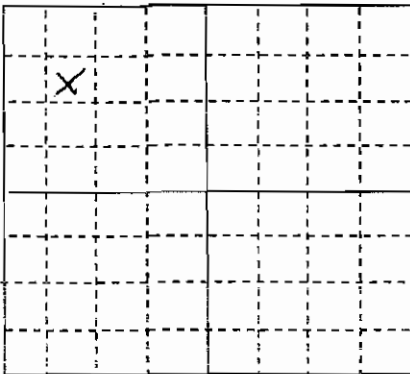
## Name and Address of Facility

Mosaic Potash Hersey  
1395 135th Ave  
Hersey, MI 49639

## Name and Address of Owner/Operator

Mosaic Potash Hersey  
1395 135th Ave  
Hersey, MI 49639

Locate Well and Outline Unit on  
Section Plat - 640 Acres



State

MI

County

Osceola

Permit Number

MI-133-3G-A002

Surface Location Description

SE 1/4 of NW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 09W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 1158 ft From (N/S) N Line of Quarter Section

And 1319 ft From (E/W) W Line of Quarter Section

## TYPE OF AUTHORIZATION

- ☐ Individual Permit  
☒ Area Permit  
☐ Rule

Number of Wells 18

Lease Name Kalium (Mosaic Potash)

WELL  
ACTIVITY

- ☐ Class I  
☐ Hazardous  
☐ Nonhazardous  
☐ Class II  
☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage  
☒ Class III

Well Number 2082

## CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
30 "			90'	30"
13 3/8"	54#		893'	17 1/2"
9 5/8"	40#		5139'	12 1/4"
7"	23 & 29 #		4700' to 7715'	8 1/2"

## METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒ Balance Method  
☐ Dump Bailer Method  
☐ Two Plug Method  
☐ Other

## CEMENT TO PLUG AND ABANDON DATA:

	Plug #1	Plug #2	Plug #3	Plug #4	Plug #5	Plug #6	Plug #7
Size of Hole or Pipe in Which Plug Will Be Placed (inches)	CIBP	7"	7"	9 5/8"	9 5/8"	9 5/8"	9 5/8"
Depth to Bottom of Tubing or Drill Pipe (ft)	5675'	5675'	5141'	4741'	4241'	3741'	3241'
Sacks of Cement To Be Used (each plug)		100 Sks	75 Sks	180 Sks	180 Sks	180 Sks	180 Sks
Slurry Volume To Be Pumped (cu. Ft.)		118.9	89.1	186.9	186.9	186.9	186.9
Calculated Top of Plug (ft.)		5141'	4741'	4241'	3741'	3241'	2741'
Measured Top of Plug (if tagged, ft.)							
Slurry Weight (Lb./Gal.)		15.6	15.6	15	15	15	15
Type of Cement or Other Material (Class III)		Class A	Class A	50/50 Poz	50/50 Poz	50/50 Poz	50/50 Poz

## LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From

To

From

To

Estimated Cost to Plug Wells

\$125,000.00

RECEIVED

OCT 26 2010

## CERTIFICATION

DNRE / ERMD  
OFFICE OF GEOLOGICAL SURVEY

I certify under the penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref 40 CFR 144.32)

Name and Official Title

(Please type or print)

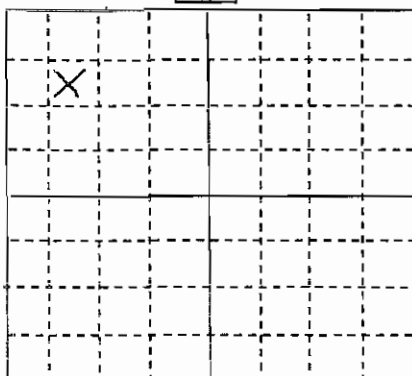
William C. Hicks, MIDFIELD SUPERVISOR

Signature

William C. Hicks

Date Signed

10/15/10

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D C 20460**PLUGGING AND ABANDONMENT PLAN****Name and Address of Facility**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, MI 49639**Name and Address of Owner/Operator**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, MI 49639Locate Well and Outline Unit on  
Section Plat - 640 AcresState  
MICounty  
OsceolaPermit Number  
MI-133-3G-A002

Surface Location Description

SE 1/4 of NW 1/4 of NW 1/4 of 1/4 of Section 26 Township 17N Range 09W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 1158 ft From (N/S) N Line of Quarter Section

And 1319 ft From (E/W) W Line of Quarter Section

**TYPE OF AUTHORIZATION**

- ☐ Individual Permit
- ☒ Area Permit
- ☐ Rule

Number of Wells 18

Lease Name Kalium (Mosaic Potash)

**WELL  
ACTIVITY**

- ☐ Class I
- ☐ Hazardous
- ☐ Nonhazardous
- ☐ Class II
- ☐ Brine Disposal
- ☐ Enhanced Recovery
- ☐ Hydrocarbon Storage
- ☒ Class III

Well Number 2082

**CASING AND TUBING RECORD AFTER PLUGGING**

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
30"			90'	30"
13 3/8"	54#		893'	17 1/2"
9 5/8"	40#		5139'	12 1/4"
7"	23 & 29 #		4700' to 7715'	8 1/2"

**METHOD OF EMPLACEMENT OF CEMENT PLUGS**

- ☒ Balance Method
- ☐ Dump Bailer Method
- ☐ Two Plug Method
- ☐ Other

**CEMENT TO PLUG AND ABANDON DATA:**

	Plug # 8	Plug #9	Plug #10	Plug #11	Plug #12	Plug #13
Size of Hole or Pipe in Which Plug Will Be Placed (inches)	9 5/8"	9 5/8"	9 5/8"	9 5/8"	9 5/8"	9 5/8"
Depth to Bottom of Tubing or Drill Pipe (ft)	2741'	2241'	1741'	1241'	741'	300'
Sacks of Cement To Be Used (each plug)	180 Sks	180 Sks	180 Sks	180 Sks	159 Sks	108 Sks
Slurry Volume To Be Pumped (cu. Ft.)	186.9	186.9	186.9	186.9	165.9	127.4
Calculated Top of Plug (ft.)	2241'	1741'	1241'	741'	300'	Surface
Measured Top of Plug (if tagged, ft.)						Surface
Slurry Weight (Lb./Gal.)	15	15	15	15	15	15.2
Type of Cement or Other Material (Class III)	50/50 poz	50/50 poz	50/50 poz	50/50 poz	50/50 poz	Class A

**LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)**

From	To	From	To

Estimated Cost to Plug Wells

\$125,000.00

**RECEIVED**

OCT 26 2010

**CERTIFICATION**DNRE / ERMD  
OFFICE OF GEOLOGICAL SURVEY

I certify under the penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref 40 CFR 144.32)

Name and Official Title (Please type or print)

WILLIAM C. MECKS MINIFIELD SUPERVISOR

Signature

William C. Mecks

Date Signed

10/15/10

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D C 20460**WELL REWORK RECORD****NAME AND ADDRESS OF PERMITTEE**Mosaic Potash Hersey  
1395 135th Ave  
Hersey MI 49639**NAME AND ADDRESS OF CONTRACTOR**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, MI 49639Locate Well and Outline Unit on  
Section Plat - 640 Acres

STATE

MI

COUNTY

Osceola

PERMIT NUMBER

MI-133-3G-A002

**SURFACE LOCATION DESCRIPTION**

SE 1/4 of NW 1/4 of NW 1/4 of Section 26 TWP 17N Range 9W

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface

Location 1158 ft. From (N/S) N Line of Quarter Section

And 1319 ft From (E/W) W Line of Quarter Section

**WELL ACTIVITY**☒ Solution Mining☐ Enhanced Recovery☐ Hydrocarbon Storage

Lease Name

Kalium (Mosaic Potash)

Total Depth Before Rework

7715'

Total Depth After Rework

5703

Date Rework Commenced

9/7/2009

Date Rework Completed

Awaiting plugging permission

**TYPE OF PERMIT**☐ Individual☒ Area

Number of Wells 18

Well Number 2082

**WELL CASING RECORD - BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	
30'	90'					
13 3/8"	893'					
9 5/8"	5139'					
7"	7715'					

**WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)**

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	

**DESCRIBE REWORK OPERATIONS IN DETAIL**

USE ADDITIONAL SHEETS IF NECESSARY

Lost mechanical integrity-Pull 4 1/2" casing-Ran bridge plug and sat down at 5703'-Ran 6" string mill and tried to clean out 7" casing unsuccessfully.Ran 6" flat bottom mill and could not get by 5703'. Ran 1 1/16 CCL and logged from 5650' to 5800'. Casing damage is evident from 5703'-5714'. Ran 3 1/16 CCL and could not get by 5703'. Ran 5 1/2" impression block and sat down at 5703'. Retrieve impression block showing marks on the outside of the block. We would request setting a bridge plug @5675' and P&A the well.

**WIRE LINE LOGS, LIST EACH TYPE**

Log Types

Logged intervals

CCL

5650'-5800'

**CERTIFICATION**

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE

SIGNATURE

DATE SIGNED

William C. Hicks  
MINEFIELD SUPERVISOR

William C. Hicks

10/15/10

EPA Form 7520-12 (Rev. 8-01)

**RECEIVED**

OCT 26 2010

DNRE / ERMD  
OFFICE OF GEOLOGICAL SURVEY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D C 20460**WELL REWORK RECORD****NAME AND ADDRESS OF PERMITTEE**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, MI 49639**NAME AND ADDRESS OF CONTRACTOR**Mosaic Potash Hersey  
1395 135th Ave  
Hersey, MI 49639

STATE

MI

COUNTY

Osceola

PERMIT NUMBER

MI-133-3G-A002

Locate Well and Outline Unit on  
Section Plat - 640 Acres**SURFACE LOCATION DESCRIPTION**

SE 1/4 of NW 1/4 of NW 1/4 of Section 26 Twp 17N R 9W

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface

Location 1158 ft From (N/S) N Line of Quarter Section

And 1319 ft From (E/W) W Line of Quarter Section

**WELL ACTIVITY**

- ☒ Solution Mining  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage

**Lease Name**

Kalium (Mosaic Potash)

Total Depth Before Rework

7715

Total Depth After Rework

5703

Date Rework Commenced

9/7/2009

Date Rework Completed

N/C

**TYPE OF PERMIT**

- ☐ Individual  
☒ Area

# of Wells 19

2082

**WELL CASING RECORD - BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture		Treatment
Size	Depth	Sacks	Type	From	To	Record		
13 3/8"	893'	900	A/Lite					
9 5/8"	5139'	2350	A/Lite					
7"	7715'	680	H					

**WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)**

Casing		Cement		Perforations		Acid or Fracture		Treatment
Size	Depth	Sacks	Type	From	To	Record		
13 3/8"	893'	900	A/Lite					
9 5/8"	5139'	2350	A/Lite					
7"	5703'	680	H					

**DESCRIBE REWORK OPERATIONS IN DETAIL**

USE ADDITIONAL SHEETS IF NECESSARY

**WIRE LINE LOGS, LIST EACH TYPE**

Log Types	Logged Intervals
Lost mechanical integrity. Pull 4 1/2" casing. Ran wireline set bridge and sat down at 5703'	
Ran 6" string mill and tried to clean out 7" casing. could not get by 5703'. Ran 6" flat bottom mill and tried milling through. could not get by 5703'. Ran 1 11/16" CCL. Logged from 5650-5800'. Appears to be damage from 5703'-5714'. Ran 3 1/8" CCL and could not get by 5703'.	CCI 5650'-5800'
Ran 5 1/2" impression block and sat down at 5703'. Only marks on the outside of the block.	
We would request setting a bridge plug @ 5675' and P&A the well. P&A form included.	

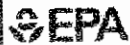
**CERTIFICATION**

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE

SIGNATURE

DATE SIGNED



United States Environmental Protection Agency  
Washington, DC 20460

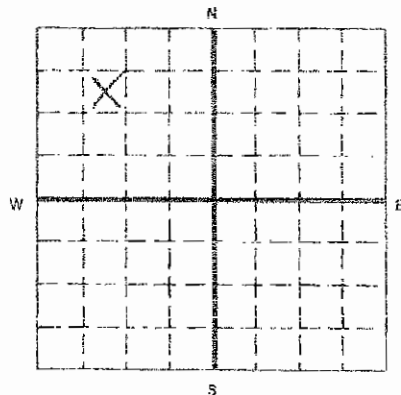
## PLUGGING AND ABANDONMENT PLAN

<b>Name and Address of Facility</b> Mosaic Potash Hersey 1395 135th Ave Hersey MI 49639		<b>Name and Address of Owner/Operator</b> Mosaic Potash Hersey 1395 135th Ave Hersey MI 49639				
<b>Locate Well and Outline Unit on Section Plat - 640 Acres</b> 		<b>State</b> MI	<b>County</b> Osceola			
		<b>Permit Number</b> MI-133-3G-A002				
<b>Surface Location Description</b> 1/4 of SE 1/4 of NW 1/4 of Section 26 Township 17n Range 9w Locate well in two directions from nearest lines of quarter section and drilling unit Surface Location 150 ft. from (N/S) N Line of quarter section and 220 ft. from (E/W) W Line of quarter section.						
<b>TYPE OF AUTHORIZATION</b> <input type="checkbox"/> Individual Permit <input checked="" type="checkbox"/> Area Permit <input type="checkbox"/> Rule Number of Wells 18 Lease Name: Kalium (Mosaic Potash)		<b>WELL ACTIVITY</b> <input type="checkbox"/> CLASS I <input type="checkbox"/> CLASS II <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> CLASS III Well Number 2082				
<b>CASING AND TUBING RECORD AFTER PLUGGING</b>						
SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE		
13 3/8	54#	893'	893'	17 1/2"		
6 5/8	40#	5139'	5139'	12 1/4"		
7	23&29#	1700-7715'	1700-7715'	8 1/2"		
<b>METHOD OF EMPLACEMENT OF CEMENT PLUGS</b>						
<input checked="" type="checkbox"/> The Balance Method <input type="checkbox"/> The Dump Bailer Method <input type="checkbox"/> The Two-Plug Method <input type="checkbox"/> Other						
<b>CEMENTING TO PLUG AND ABANDON DATA:</b>						
PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	CIBP	7"	7"	9 5/8"	9 5/8"	9 5/8"
Depth to Bottom of Tubing or Drill Pipe (ft)	5675'	5675'	5141'	4741'	4241'	3741'
Sacks of Cement To Be Used (each plug)		100 Sks	75 Sks	180 Sks	180 Sks	180 Sks
Slurry Volume To Be Pumped (cu. ft.)		118.5	89.1	186.9	186.9	186.9
Calculated Top of Plug (ft.)		5141'	4741'	4241'	3741'	3241'
Measured Top of Plug (if tagged ft.)						
Slurry Wt. (Lb./Gal.)		15.6	15.6	15.0	15.0	15.0
Type Cement or Other Material (Class III)		Class A	Class A	50/50pc	50/50 pc	50/50 pc
<b>LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)</b>						
From	To	From	To			
<b>Estimated Cost to Plug Wells</b> 75 000.00						
<b>Certification</b>						
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)						
<b>Name and Official Title (Please type or print)</b>			<b>Signature</b>		<b>Date Signed</b>	


 United States Environmental Protection Agency  
 Washington, DC 20460

# PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility Mosaic Potash Hersey 1395 135th Ave Hersey, MI 49639	Name and Address of Owner/Operator Mosaic Potash Hersey 1395 135th Ave Hersey MI 49639
---	--

 Locate Well and Outline Unit on  
 Section Plat - 640 Acres


State MI	County Osceola	Permit Number MI-133-3G-A002
-------------	-------------------	---------------------------------

## Surface Location Description

1/4 of SE 1/4 of NW 1/4 of NW 1/4 of Section 26 Township 17N Range 9W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

 Location 115 ft from (N.S.) N Line of quarter section  
 and 129 ft from (E.W.) W Line of quarter section.

## TYPE OF AUTHORIZATION

- ☐ Individual Permit  
☒ Area Permit  
☐ Rule

Number of Wells 18

Lease Name Kalium (Mosaic Potash)

## WELL ACTIVITY

- ☐ CLASS I  
☐ CLASS II  
☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage  
☒ CLASS III

Well Number 2082

## CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
13 3/8"	54#		893'	17 1/2"
9 5/8"	40#		5139'	12 1/4"
7"	23.829#		4700-7715'	8 1/2"

## METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒ The Balance Method  
☐ The Dump Bailer Method  
☐ The Two-Plug Method  
☐ Other

## CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (Inches)	9 5/8"	9 5/8"	9 5/8"	9 5/8"	9 5/8"	9 5/8"	9 5/8"
Depth to Bottom of Tubing or Drill Pipe (ft)	274'	224'	174'	124'	74'	300'	
Sacks of Cement To Be Used (each plug)	180 Sks	180 Sks	180 Sks	180 Sks	159 Sks	108 Sks	
Slurry Volume To Be Pumped (cu ft.)	186.9	186.9	186.9	186.9	165.9	127.4	
Calculated Top of Plug (ft.)	224'	174'	124'	74'	300'	Surface	
Measured Top of Plug (if tagged ft.)						Surface	
Slurry Wt (Lb./Gal.)	15.0	15.0	15.0	15.0	15.0	15.2	
Type Cement or Other Material (Class III)	50/50 po	50/50 po	50/50 Po	50/50 Po	50/50 Po	Class A	

## LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells

75,000.00

## Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)	Signature	Date Signed
--	-----------	-------------



**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994 as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

- ☐ Part 615 Oil/Gas Well      ☐ Plugging  
☒ Part 625 Mineral Well      ☒ Change of Well Status

Permit number <b>438</b>	Well name and number <b>Kalium 2082</b>
API number <b>MI-133-3G-A002</b>	
Name and address of permittee <b>Mosaic Potash Hersey 1395 135<sup>th</sup> Ave Hersey, Mi 49639</b>	
Type of well <b>Solution Mining</b>	Field name <b>Kalium</b>
Surface location <b>SE 1/4    NW 1/4    SW 1/4    Sec 26    T 17N    R 9W</b>	
Township <b>Hersey</b>	County <b>Osceola</b>
Date plugging/change started <b>11/10/2007</b>	Date plugging/change completed <b>12/5/2007</b>
DEQ employee issuing plugging permit or approving Change of Well Status <b>Rav Vuorinovich</b>	

Name and address of contractor/service company

**Mosaic Potash Hersey  
1395 135<sup>th</sup> Ave  
Hersey, Mi 49639**

Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse.

**WELL PLUGGING**  
(Hole conditions after plugging)**CASING**

Casing size	Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled

**PLUGS**

Depth of plug Bottom      Top	Make and type of bridge or plug	Cement plugs: type amount of cement & mix water	Additives, type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N

☐ Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse.

☐ Check if cores were taken and attach core descriptions

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well.

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

COMPLETE BOTH SIDES

API number MI-133-3G-A002	Permit number 438
------------------------------	----------------------

### CHANGE OF WELL STATUS

Change was to: <input type="checkbox"/> Convert current zone to: <input type="checkbox"/> Production <input type="checkbox"/> Disposal <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Storage <input type="checkbox"/> Other _____	<input type="checkbox"/> Remediate well: <input type="checkbox"/> Perf and test existing zone <input checked="" type="checkbox"/> Repair casing/cement <input type="checkbox"/> Other _____	<input type="checkbox"/> Plugback (recomplete as) <input type="checkbox"/> New production zone <input type="checkbox"/> Disposal <input type="checkbox"/> Secondary recovery <input type="checkbox"/> Storage <input type="checkbox"/> Other _____	<input type="checkbox"/> Redrill: <input type="checkbox"/> Horizontal drain hole <input type="checkbox"/> Collapsed casing <input type="checkbox"/> Underream open hole <input type="checkbox"/> Other _____
---	--	---	--

#### Well casing record - BEFORE change

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	
13 3/8	893'	900	A				
9 5/8	5139'	2425	A				
7	7715'	680	H				

#### Well casing record - AFTER change (Indicate additions and changes only, complete test record)

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	
7	7715'	680	H				Casing patch installed at 2851'

#### BEFORE CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

#### AFTER CHANGE

Total depth	Completed Fm	Well completed for	
BOPD	MCFGPD	Inj Rate	Pressure

#### DAILY PRODUCTION TEST RECORD

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure	
				Tubing	Casing

#### DAILY INJECTION TEST RECORD ☐ Injection well ☐ Brine disposal

Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
		Beginning	Ending	

### DAILY CHRONOLOGY

Describe in detail the daily chronology of change/plugging, include days shut down. Describe exceptions to issued plugging instructions. Describe tools, tubing etc left in hole and any logs run. Include dates pits filled, surface restored etc. Use additional pages as needed.

Date	Narrative
11/13/07	Set Cast iron bridge plug @ 5815' , dump 20 bags of sand on top of the plug.
11/16/07	Run packer testing for hole at various depths- initial packer was leaking by, rented tension packer from Pioneer.
11/20/07	Found hole at 6' below wellhead. Cut off 7 inch at 7 feet below wellhead. Pulled slips and 7 inch stub. Due to
11/27/07	past experience we cut and pulled 1520' of 7 inch casing, dressed off the 7 inch stub and patched the 7 inch at 1520'. Pressure up the 7"and still had a leak, pulled more on the patch and parted the pipe @ 2851'
11/29/07	Pulled 7 inch casing- Ran packer and tested below the parted pipe all ok.
11/30/07	Dressed off the top of the 7 inch. Run 7 inch casing and casing patch. Set patch at 2851'. Weld on wellhead
12/4/07	Tested casing -Mark Smith witnessed the test. Retrieve the bridge plug and run 4 1/2" casing to 6000'

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells Act 451 PA 1994 as amended a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION 'I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge.'

Name and title (printed or typed) <b>ROBERT SCHWEITZER, PRODUCTION SUPT</b>	Authorized signature <i>Robert Schweitzer</i>	Date <b>12/5/07</b>
--	--	------------------------

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.

**REQUEST FOR TRANSFER OF PERMIT**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment


☐ Part 615 Oil/Gas Well☒ Part 625 Mineral Well

Permit number M-438	Well type Brine Prod.	Current true vertical depth 7565
Well name and number Kalium Hersey 2082		
Surface location SE 1/4 NW 1/4 SW 1/4 Section 26 T 17N R 9W		
Township Hersey		County Osceola

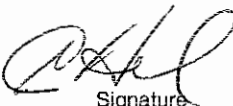
NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13)

**This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.**

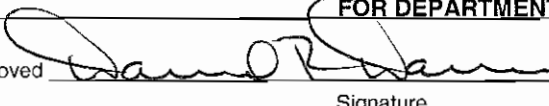
**TRANSFER OF A PERMIT FROM:**

Name(s) of Selling Permittee(s) IMC Kalium, Limited		Fed. I.D.# or S.S.# 38-3545577	
Address: Number and Street, City or Town, State, ZIP Code Telephone 1395, 135th Avenue Hersey, MI, 49639		231-832-3755	
All permits rights and responsibilities are discharged by:			
IMC Kalium Limited Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**TRANSFER OF A PERMIT TO:**

Name(s) of Acquiring Permittee(s): IMC Potash Hersey Inc.		Fed. I.D.# or S.S.# ME0132184	
Address: Number and Street, City or Town, State ZIP Code 1395 135th Avenue Hersey, MI, 49639		Telephone 231-832-3755	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <u>Royal Bank of Canada</u>			
<input checked="" type="checkbox"/> Blanket <input checked="" type="checkbox"/> On File Bond Number <u>P43087C00008</u> Amount <u>\$25,000</u>			
<input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
IMC Potash Hersey Inc. Permittee	Colin Howard Authorized representative name	 Signature	16/04/2001 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

**FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY**


Approved  Signature	MAY 08 2001 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lanning <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner
---	---------------------	--







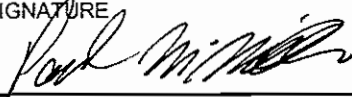


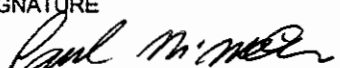
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460																																																																																						
EPA		WELL REWORK RECORD																																																																																				
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639																																																																																			
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES			STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002 <b>M438</b>																																																																																	
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 100px; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: 0; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: 0; top: 50%; transform: translateY(-50%);">E</div> <div style="position: absolute; left: 10%; top: 30%;">X</div>																																																																																			SURFACE LOCATION DESCRIPTION SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1118ft from (N/S) N Line of quarter section and 1319 ft. from (E/W) W line of quarter section			
WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework 7800		TYPE OF PERMIT <input type="checkbox"/> Individual																																																																																		
Lease Name Kalium Hersey		Total Depth After Rework 7800		<input checked="" type="checkbox"/> Area																																																																																		
		Date Rework Commenced 2/1/99		Number of Wells 17																																																																																		
		Date Rework Completed 2/4/99		Well Number 2081																																																																																		
WELL CASING RECORD - BEFORE REWORK																																																																																						
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																																
Size	Depth	Sacks	Type	From	To																																																																																	
30	90	Driven																																																																																				
13 3/8	908	825	A																																																																																			
9 5/8	5134	1950	A																																																																																			
7	7718	730	H																																																																																			
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																																																						
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																																
Size	Depth	Sacks	Type	From	To																																																																																	
30	90	Driven																																																																																				
13 3/8	908	825	A																																																																																			
9 5/8	5134	1950	A																																																																																			
7	7718	730	H	7706	7704	4sh/ft																																																																																
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type																																																																																		
				Log Types		Logged intervals																																																																																
Trip standing. Perf 7" casing from 7695' - 7702'. Lowered liner 6'																																																																																						
CERTIFICATION																																																																																						
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).																																																																																						
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE 		DATE SIGNED 02/22/98																																																																																	



JAN 13 1999

Form Approved. OMB No 2040-0042. Expires 6-30-98

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460																																																																																																								
EPA		WELL REWORK RECORD		<div style="font-size: 2em; font-weight: bold; margin: 0;">RECEIVED</div> <div style="margin-top: 5px;">JAN 14 1999</div> <div style="margin-top: 5px; font-size: 0.8em;">GEOLOGICAL SURVEY DIV. ENVIRONMENTAL QUALITY</div>																																																																																																				
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639			NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639																																																																																																					
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES		STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002																																																																																																				
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 100px; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: -40px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -40px; top: 50%; transform: translateY(-50%);">E</div>																																																																																																						SURFACE LOCATION DESCRIPTION SE1/4 of NW1/4 of SW1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1158ft from (N/S) N Line of quarter section and 1319 ft. from (E/W) W line of quarter section		
WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework 7715	TYPE OF PERMIT <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area																																																																																																					
Lease Name Kalium Hersey		Total Depth After Rework 7715	Number of Wells 17																																																																																																					
		Date Rework Commenced 12/15/98	Well Number 2082																																																																																																					
		Date Rework Completed 12/15/98																																																																																																						
WELL CASING RECORD - BEFORE REWORK																																																																																																								
Casing		Cement		Perforations																																																																																																				
Size	Depth	Sacks	Type	From	To																																																																																																			
30	90	Driven																																																																																																						
13 3/8	893	900	A																																																																																																					
9 5/8	5139	2425	A																																																																																																					
7	7715	680	H																																																																																																					
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																																																																								
Casing		Cement		Perforations																																																																																																				
Size	Depth	Sacks	Type	From	To																																																																																																			
30	90	Driven																																																																																																						
13 3/8	893	900	A																																																																																																					
9 5/8	5139	2425	A																																																																																																					
7	7715	680	H																																																																																																					
Describe rework operations in detail. Use additional sheets if necessary				Wire line logs, list each type																																																																																																				
				Log Types	Logged intervals																																																																																																			
Perforate 7700' - 7702'																																																																																																								
CERTIFICATION																																																																																																								
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).																																																																																																								
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor			SIGNATURE 		DATE SIGNED 01/09/99																																																																																																			

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY																																																																																																										
WASHINGTON, DC 20460																																																																																																										
EPA WELL REWORK RECORD																																																																																																										
NAME AND ADDRESS OF PERMITTEE IMC Kallium, Ltd 1395 135th Avenue Hersey, MI 49639				NAME AND ADDRESS OF CONTRACTOR IMC Kallium, Ltd. 1395 135th Avenue Hersey, MI 49639																																																																																																						
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES		STATE MI	COUNTY Osceola	PERMIT NUMBER MI-133-3G-A002																																																																																																						
<div style="text-align: center;">N</div> <table border="1" style="width: 100%; height: 150px; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;">S</div> <div style="position: absolute; left: -20px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -20px; top: 50%; transform: translateY(-50%);">E</div> <div style="position: absolute; left: 5%; top: 75%; transform: translateX(-50%);">X</div>																																																																																																						SURFACE LOCATION DESCRIPTION SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location 1158 ft from (N/S) N Line of quarter section and 1319 ft. from (E/W) W line of quarter section				
WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework 7715		TYPE OF PERMIT <input type="checkbox"/> Individual																																																																																																						
Lease Name Kallium Hersey		Total Depth After Rework 7715		<input checked="" type="checkbox"/> Area																																																																																																						
		Date Rework Commenced 9/8/98		Number of Wells 18																																																																																																						
		Date Rework Completed 9/9/98		Well Number 2082																																																																																																						
WELL CASING RECORD - BEFORE REWORK																																																																																																										
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																																																				
Size	Depth	Sacks	Type	From	To																																																																																																					
30	90	Driven																																																																																																								
13 3/8	893	900	A																																																																																																							
9 5/8	5139	2425	A																																																																																																							
7	7715	880	H																																																																																																							
WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)																																																																																																										
Casing		Cement		Perforations		Acid or Fracture Treatment Record																																																																																																				
Size	Depth	Sacks	Type	From	To																																																																																																					
30	90	Driven																																																																																																								
13 3/8	893	900	A																																																																																																							
9 5/8	5139	2425	A																																																																																																							
7	7715	680	H																																																																																																							
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type																																																																																																						
				Log Types	Logged intervals																																																																																																					
Pull standing. Trip in hole. PFC. Land liner @ 7722'.																																																																																																										
CERTIFICATION																																																																																																										
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).																																																																																																										
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor				SIGNATURE 		DATE SIGNED 09/11/98																																																																																																				

RECEIVED

SEP 17 1998

GEOLOGICAL SURVEY DIV.  
ENVIRONMENTAL QUALITY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY							
WASHINGTON, DC 20460							
<b>EPA WELL REWORK RECORD</b>							
NAME AND ADDRESS OF PERMITTEE IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639				NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639			
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT - 640 ACRES		STATE <b>MI</b>	COUNTY <b>Oseola</b>	PERMIT NUMBER <b>MI-133-3G-A002 M438</b>			
		SURFACE LOCATION DESCRIPTION <u>SE1/4 of NW1/4 of SW1/4 of 1/4 of Section 26 Township 17N Range 9W</u> Locate well in two directions from nearest lines of quarter section and drilling unit					
		Surface Location <u>1158 ft.</u> from (N/S) <u>N</u> Line of quarter section and <u>1319 ft.</u> from (E/W) <u>W</u> line of quarter section					
		WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol'n Mining		Total Depth Before Rework <b>7715</b> Total Depth After Rework <b>7715</b> Date Rework Commenced <b>8/6/98</b> Date Rework Completed <b>8/14/98</b>		TYPE OF PERMIT <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area Number of Wells <u>18</u> Well Number <b>2082</b>	
		Lease Name <b>Kalium Hersey</b>					
<b>WELL CASING RECORD - BEFORE REWORK</b>							
Casing Size      Depth		Cement Sacks      Type		Perforations From      To		Acid or Fracture Treatment Record	
30          90		Driven					
13 3/8      893		900      A					
9 5/8      5139		2425    A					
7          7715		680      H					
<b>WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)</b>							
Casing Size      Depth		Cement Sacks      Type		Perforations From      To		Acid or Fracture Treatment Record	
30          90		Driven					
13 3/8      893		900      A					
9 5/8      5139		2425    A					
7          7715		680      H					
Describe rework operations in detail Use additional sheets if necessary				Wire line logs _____ Log Types _____			
Pull standing. Run in hole with THL set @ 7735'. Pull THL - plugged				Geological Survey Div. _____ Environmental Quality _____			
Clean out & land O.D.. PFC				Logged intervals _____			
<b>CERTIFICATION</b>							
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).							
NAME AND OFFICIAL TITLE (Please type or print) <b>Paul McMillen</b> Minefield Supervisor				SIGNATURE 		DATE SIGNED <b>08/21/98</b>	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY							
WASHINGTON DC 20460							
<b>EPA</b>		<b>WELL REWORK RECORD</b>					
NAME AND ADDRESS OF PERMITTEE IMC Kalium Ltd 1395 135th Avenue Hersey, MI 49639				NAME AND ADDRESS OF CONTRACTOR IMC Kalium, Ltd 1395 135th Avenue Hersey, MI 49639			
LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT -- 640 ACRES		STATE <b>MI</b>	COUNTY <b>Osceola</b>		PERMIT NUMBER <b>MI-133-3G-A002</b>		
<div style="text-align: center;">N</div> <div style="text-align: center;">S</div> <div style="position: absolute; left: -40px; top: 50%; transform: translateY(-50%);">W</div> <div style="position: absolute; right: -40px; top: 50%; transform: translateY(-50%);">E</div>		SURFACE LOCATION DESCRIPTION <u>SE 1/4 of NW 1/4 of SW 1/4 of 1/4 of Section 26 Township 17N Range 9W</u> Locate well in two directions from nearest lines of quarter section and drilling unit  Surface Location <u>1158 ft</u> from (N/S) <u>N</u> Line of quarter section and <u>1319 ft.</u> from (E/W) <u>W</u> line of quarter section					
		WELL ACTIVITY <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Sol n Mining		Total Depth Before Rework <b>7715</b>		TYPE OF PERMIT <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area	
		Lease Name <b>Kalium Hersey</b>		Total Depth After Rework <b>7715</b>		Number of Wells <u>18</u>	
				Date Rework Commenced <b>4/3/98</b>		Well Number <b>2082</b>	
				Date Rework Completed <b>4/21/98</b>			
<b>WELL CASING RECORD - BEFORE REWORK</b>							
Casing		Cement		Perforations		Acid or Fracture Treatment Record	
Size	Depth	Sacks	Type	From	To		
30	90	Driven					
13 3/8	893	900	A				
9 5/8	5139	2425	A				
7	7715	680	H				
<b>WELL CASING RECORD - AFTER REWORK (Indicate Additions and Changes Only)</b>							
Casing		Cement		Perforations		Acid or Fracture Treatment Record	
Size	Depth	Sacks	Type	From	To		
30	90	Driven					
13 3/8	893	900	A				
9 5/8	5139	2425	A				
7	7715	680	H				
Describe rework operations in detail Use additional sheets if necessary				Wire line logs, list each type			
Run 2 7/8" tubing in hole. 2 7/8" tubing parted. Fish tubing. Rerun tubing to bottom. Circulate well. Trip stding. MIT. Rerun tubing. Trip stding Run OCHL Logs. Rerun tubing. PFC.				Log Types		Logged intervals	
				OCH 5" scale		7849-0	
				OCH 25" scale		7849-6500	
				PFC			
<b>CERTIFICATION</b>							
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. CFR 144.32).							
NAME AND OFFICIAL TITLE (Please type or print) Paul McMillen Minefield Supervisor				SIGNATURE 		DATE SIGNED <b>06/02/98</b>	



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - GEOLOGICAL SURVEY DIVISION  
**CERTIFICATION OF CASING AND SEALING OF SURFACE HOLE**

MAR 30 1998

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells, of Act 451 PA 1994, as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment

Permit number	M438
Well name	KALUM HERSEY 2082
Surface location	SE 1/4 of NW 1/4 of SW 1/4 Section 26 T 17N R 9W
Name and address of drilling contractor	MCLACHLIN DRILLING COMPANY P.O. BOX 548 EVART, MI, 49631

Township	HERSEY	County	OSCEOLA
Name and address of permittee IMC KALUM CHEMICALS, LTD 1395 135th AVE HERSEY, MI, 49639			

**SURFACE HOLE**

Hole diameter (Note reductions)	Depth to bedrock	Base of specified aquifer (see permit)	Total depth of surface hole	Formation at surface casing seat	Date drilling completed
17 1/2"	769	769	891	MICH GROUP	9/20/97

Narrative of unusual drilling circumstances or problems encountered

N/A

Name and address of geologist/mud logger

ALLEN BRIGHT  
P.O. BOX 320  
LAKE ANN, MI. 49650

Signature

*Allen Bright*

Date

9-20-97

**SURFACE CASING**

Casing O.D. (in)	Casing depth	Cement type and additives	Amount of cement (sacks)	Volume (bbls)		Plug down date & time
				Pumped	Returned to surface	
13 3/8	891	LITE	575	247	0	0200
		A	200	134	0	9/21/97

Narrative of problems encountered running or cementing casing Note any cement fallback grouting, or lost circulation zones

GROUTED WITH 125 SACKS (26 BBLs) CLASS "A" W/3% CaCl<sub>2</sub>  
3 BBLs RETURNS

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

Signature of permittee or company officer

*[Signature]*

Date

MARCH 15, 1998

Submit the original and one copy, typewritten or legible printed, within 30 days after drilling is completed to:

GEOLOGICAL SURVEY DIVISION  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48909-7756

MAR 10 1990

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
P.O. BOX 30028 LANSING MICHIGAN 48909

# RECORD OF WELL DRILLING OR DEEPENING

USE APPROPRIATE BLOCKS. FOR ITEMS NOT LISTED SUBMIT ATTACHMENTS

REQUIRED BY AUTHORITY OF:

☐ ACT 61 P.A. 1939, AS AMENDED  
(Submit 2 copies within 30 days  
of completion.)

☒ ACT 315, P.A. 1969, AS AMENDED  
(Submit 2 copies within 60 days  
of completion.)

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN  
FINES AND/OR IMPRISONMENT.

PERMIT NO./DEEPENING PERMIT NO <b>M-438</b>			TYPE OF WELL (after completion) <b>Solution Mining</b>		
FIELD/FACILITY NAME <b>Hersey Potash</b>					
WELL NAME & NUMBER <b>Kalium Hersey 2082</b>					
SURFACE LOCATION <b>SE 1/4 of NW 1/4 of SW 1/4 Section 26 T 17N R 9W</b>					
NAME AND ADDRESS OF OWNER <b>IMC Kalium Chemicals, Ltd. 1395 135th Avenue Hersey, MI 49639</b>			TOWNSHIP <b>Hersey</b>		
			COUNTY <b>Osceola</b>		
NAME AND ADDRESS OF DRILLING CONTRACTOR <b>McLachlin Drilling Company PO Box 548 Evart, MI 49631</b>			FOOTAGES: NORTH/SOUTH <b>1158 Ft. from North Line and 1319 Ft. from West Line of 1/4 Sec.</b>		
			EAST/WEST		
DATE DRILLING BEGAN <b>9/21/97</b>			DATE DRILL COMPLETED <b>10/22/97</b>		
DATE WELL COMPLETED <b>10/26/97</b>			SUBSURFACE LOCATION (if directionally drilled) <b>NE 1/4 of SW 1/4 of SW 1/4 Section 26 T 17N R 9W</b>		
TOTAL DEPTH OF WELL Driller <b>7814</b> Log <b>7812</b>			TOWNSHIP <b>Hersey</b>		
FORMATION AT TD <b>A-1 Evap</b>			COUNTY <b>Osceola</b>		
PROD. FORMATION(S) <b>A-1 Evap</b>			FOOTAGES: NORTH/SOUTH <b>839 Ft. from South Line and 1142 Ft. from West Line of 1/4 Sec.</b>		
DATE OF FIRST INJECTION <b>TBA</b>			EAST/WEST		
INJECTED FORMATION <b>A-1 Evap</b>			FEET DRILLED — CABLE TOOLS From <b>N/A</b> To <b>0</b>		
SOLUTION FORMATION <b>A-1 Evap</b>			FEET DRILLED — ROTARY TOOLS From <b>0</b> To <b>7814</b>		
ELEVATIONS K.B. <b>1149.5 ft.</b> R.F. <b>1148.5 ft.</b> R.T. <b>N/A ft.</b> Grd. <b>1135.6 ft.</b>					

## CASING, CASING LINERS AND CEMENTING, OPERATING STRINGS

## PERFORATIONS

SIZE	WHERE SET	CEMENT	FT. PULLED	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
							YES	NO
13 3/8	893	900	---					
9 5/8	5139	2425	---					
7	7715	680	---					

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
None			None	None		None	Sam- ples	Odor	Pits	Mud Line	Gas Log.	Fill Up

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	INTERVAL TREATED	MATERIALS AND AMOUNT USED	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	None	None	None				

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION

## DEVIATION SURVEY

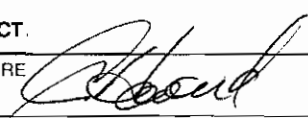
## PLUGGED BACK

BRAND	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTION	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	x	Sonic - G/R	5100-7808			2500	1.2			
<del>Schl.</del> Schl.	x	Neutron - G/R	5100-7808			5000	.6			
M.W.	x	Cement Bond	4630-7704			6000	18.9			
DDL	x	Directional	0-7750			7500	3.4			

## PRODUCTION TEST DATA

OIL — Bbls/day	GRAVITY — °API	COND Bbls/day	GAS — MCF/day	WATER — Bbls/day	H <sub>2</sub> S — Grains/100 cu ft	BHP AND DEPTH
N/A	N/A	N/A	N/A	N/A	N/A	N/A

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
March 15, 1998	Colin Howard, Production Geologist	

## KH2082

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

ELEVATION USED		GEOLOGIST NAME:		TOPS TAKEN FROM		
1149.5		Colin Howard		<input checked="" type="checkbox"/> DRILLERS LOG <input type="checkbox"/> SAMPLE LOG <input type="checkbox"/> ELECTRIC LOG		
FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)		FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)
NOTE: IF WELL DIRECTIONALLY DRILLED, ADD TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE						
0	769	Drift				
769	1374	Michigan Group				
1374	1467	Triple Gyp				
1467	1578	Brown Lime				
1578	1684	Stray Sand				
1684	1848	Marshall Sand				
1848	2600	Coldwater Shale				
2600	2697	Sunbury Shale				
2697	3117	Ellsworth Shale				
3117	3257	Antrim Shale				
3257	3303	Traverse Formation				
3303	3801	Traverse Lime				
3801	3877	Bell Shale				
3877	3944	Dundee				
3944	3973	Reed City Anhydrite				
3973	4124	Reed City Dolomite				
4124	4191	Detroit River Anhydrite				
4191	4590	Detroit River Salt				
4590	4716	Detroit River Sour				
4716	5006	Massive Anhydrite				
5006	5128	Black Lime				
5128	5219	Sylvania				
5219	5380	Bois Blanc				
5380	5701	Bass Island				
5701	5709	Salina				
5709	5733	F-Unit				
5733	6038	F-Salt				
6038	6421	E-Unit				
6421	6467	D-Salt				
6467	6687	C-Shale				
6687	6920	B-Salt				
6920	7060	A-2 Carbonate				
7060	7416	A-2 Evaporite				
7416	7480	A-1 Carbonate				
7480	7750	A-1 Evaporite (T.D.)				
IF WELL WAS CORED, ATTACH CORE DESCRIPTION						
DRILL STEM TEST DATA						
LIST ATTACHMENTS:						
DDL - Oncourse Directional						
SCHL. - Sonic G/R						
SCHL. - Neutron						
M.W. - Cement Bond						
GEOLOGICAL SURVEY USE ONLY						
REVIEWED BY:						
DATE OF REVIEW:						

6729

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING MICHIGAN 48909

**PERMIT TO**

☒ DRILL ☐ DEEPEN ☐ REWORK ☐ OPERATE

GRANTED UNDER PROVISIONS OF

☐ Act 61 P.A. 1939, as amended ☒ Act 315, P.A. 1969 as amended  
(M.C.L. 319.1 to 319.27) (M.C.L. 319.211 to 319.236)

Violation of and/or non-compliance with the provisions  
of the acts and conditions of permit may result in penalties.  
This permit includes as requirements all the operations and methods  
proposed by the applicant, unless rejected or altered by the DNR, and  
along with the attached stipulations are incorporated in its entirety by  
reference.

WELL NAME

WELL NO

Kalium Hersey

2082

LOCATION AND FOOTAGES:

SHL: SE $\frac{1}{4}$  NW $\frac{1}{4}$  SW $\frac{1}{4}$ , Sec. 26, T17N, R9W, Hersey Twp., Osceola  
1158 ft. from North and 1319 ft. from West line of quarter section.  
BHL: NE $\frac{1}{4}$  SW $\frac{1}{4}$  SW $\frac{1}{4}$ , Sec. 26, T17N, R9W, Hersey Twp., Osceola Co.  
839 ft. from South and 1142 ft. from West line of quarter section.

PERMIT <b>M438</b>	ISSUED <b>9/9/97</b>	TYPE OF WELL <b>Brine Production</b>
CANCEL AND TRANSFER	ISSUED	FORMATION <b>A-1 Evaporite</b>
DEEPENING PERMIT		DEPTH <b>8,000' MD, 7,850' TVD</b>
PERMIT EXPIRES <b>3/9/98</b>		KIND OF TOOLS <b>Rotary</b>
ISSUED TO <b>IMC Kalium, Ltd. 1395 135th Avenue Hersey, MI 49639</b>		

O.O. SIZE	WT./FT.	CASING		CASING AND SEALING REQUIREMENTS			CEMENT	W.O.C. (HRS.)
		GRADE	CONDITION	DEPTH	SACKS			
13 3/8"	48#	J-55	New/Used	900'	700		16	
9 5/8"	40#	K-55	New/Used	5000'	1600		16	
7 "	23#	L-80	New	7950'	500		24	

1. No earthen reserve pit is to be dug. Steel tanks are to be used to contain drilling fluids and cuttings.
2. Solids and cuttings shall be hauled to the Northern Oaks landfill.
3. Wellhead shall be rated at 5000 psi.
4. 9 5/8" intermediate casing shall be set a minimum 100' into the Amherstburg formation.

OFFICE TO BE NOTIFIED BEFORE DRILLING/DEEPENING STARTS

CADILLAC (616) 775-3960

BY

*William Lee*

WILLIAM LEE (517) 334-6974

PERMIT COORDINATOR

PAGE 1 of PAGE(S)

FOR THE SUPERVISOR OF WELLS/MINERAL WELLS



## THIS PERMIT IS SUBJECT TO THESE GENERAL CONDITIONS

1. Drilling operations shall not start until the drill site preparation requirements are completed
2. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all the terms and conditions of this permit and the rules, orders and requirements of the Supervisor of Wells/Mineral Wells.
3. The permittee is required to give notice to public utilities in accordance with Act 53, PA 1974 (M C L 460 701 to 460.718).
4. Any changes from what is stated in the permit application and permit shall be approved by the Supervisor of Wells/Mineral Wells
5. This permit is valid only for the permittee of issue and any change of ownership shall be accompanied by a request to the Supervisor of Wells/Mineral Wells to transfer the permit from the current owner to the new owner
6. NOTICE AND REQUIREMENTS FOR SOURCES OF WATER AND WATER WELLS USED IN CONJUNCTION WITH OIL AND GAS OR MINERAL WELL DRILLING AND OPERATIONS" December 1 1984 is made part of and a condition of this permit
7. During well completion and testing procedures all fluids shall be contained in tanks and transported to off site disposal facilities
8. The Michigan Air Pollution Control Commission rules require that a person shall not install nor alter sour gas or oil well production equipment and flare unless a permit to install has been approved by the Commission. An operator is allowed to drill and test a sour well prior to obtaining the necessary permit to install from the Commission, but is not allowed full production of such wells before issuance of the necessary air use permits
9. This permit does not convey property rights in either real estate or material or does it authorize any injury to private property or invasion of private or public rights or does it waive the necessity of seeking federal and local permits or complying with other state statutes
10. If a Hydrogen Sulphide contingency plan is required a copy of PART II of the plan shall be posted in the primary briefing area
11. All trash and garbage shall be removed from the drill site at the completion of drilling.
12. Blowout preventers, accumulators and pumps shall be certified as operable under the product manufacturer's minimum operational specifications. This certification shall include proper operation of the closing unit, valving, pressure gauges, and manufacturer's recommended accumulatory fluids. Certification may be obtained through those companies presently used to test the blowout preventers stack and casing. Certification shall be required annually and shall be posted on the rig floor.
13. In addition to the primary closing system including an accumulator system, the blowout preventers shall have a secondary system. A combination of any two of the following secondary closing systems will be acceptable: Electric-operated pump; Air-operated pump; Hand-operated pump or nitrogen. Extensions with hand wheels are not mandatory
14. Blowout preventer rams shall be of proper size for the drill pipe being used or production casing being run in the well. Variable type rams of the proper size range will be acceptable
15. The gas buster and flare system shall be in place and operable prior to drilling into a reservoir known or believed to contain Hydrogen Sulphide in excess of 500 ppm with the intention to complete in and/or test that reservoir.
16. A trip tank, or any accurate fluid monitoring system, as well as a gas buster and flare system where justified, shall be in place when penetrating the A2 Carbonate formation. Changes may be granted by the Department of Natural Resources District Geologist.

TRANSMITTAL AND FIELD REVIEW  
FOR PROPOSED WELL SITE☐ Part 615 Supervisor of Wells, Act 451 PA 1994, as amended☒ Part 625 Mineral Wells, Act 451 PA 1994, as amended

CADILLAC DIST. GEOLOGIST GPR

1a Application number MW 970011	1b Owner number	1c Revision <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1d Coordinator R. LEFERILLER	1e Date sent 6-3-97
2 Applicant IMC KALIUM, LTD.				1f. District CADILLAC
3a Well name and number KALIUM HERSEY #2082			3b Other permit numbers	
4a Surface location SE 1/4 NW 1/4 SW 1/4 Sec 26 T 17N R 9W			Township HERSEY	County OSCEOLA
4b Footages 1158 ft from North line of 1/4 sec 1319 ft from West line of 1/4 sec				
5a Surface Ownership <input checked="" type="checkbox"/> Private <input type="checkbox"/> State <input type="checkbox"/> Federal			5b Mineral ownership <input checked="" type="checkbox"/> Private <input type="checkbox"/> State <input type="checkbox"/> Federal	
6 Information and requests: (Spacing, problem areas etc.) MINERAL EXTRACTION WELL			5c Well site area local zoning <input checked="" type="checkbox"/> Other: NOT ZONED JUN 28 1997 GEOLOGICAL SURVEY CADILLAC	

## FIELD REVIEW AND RECOMMENDATIONS

7 Field review by: name and date MOSS	8a Land use: MINING	8b Cover type/density: GRAVEL
9 Topography - (slope % grade) FLAT	10a. Area involved: EXISTING PAD Drill pad: Acres	10b. Area involved Access road EXISTING Acres
11 Soil type and drainage field tiles etc	STAND & GRAVEL FILL	
12 Are soil erosion and sedimentation control measures adequate? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
13 Type direction & distance to surface waters waterways, wet lands flood plains and natural rivers within 1/4 mile	NONE	
14 Nearby scenic historical or recreational areas. environmentally sensitive, critical dunes, and threatened and endangered species within 1/4 mile	N.A.	
15 Buildings public roads, pipelines and power lines, water wells within 300 feet of proposed well site.	MINERAL WELL CLUSTER	
16 Is casing and sealing adequate? Conductor <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Surface <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Intermediate <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Production <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Expected depth to base of fresh water, formation SHOULD BE SET IN AMHERSTBURG FM OR LOWER SEE MEMO	
17 Is Intermediate Casing Exception recommended? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
18 B.O.P. Program adequate? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If certified tests required, give details.	WELLHEAD SHOULD BE 5000'	
19 H <sub>2</sub> S <input type="checkbox"/> "Sweet" <input type="checkbox"/> Sour' Class <input type="checkbox"/> Plan required Plan complete and accurate? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
20 SI 2-87 apply? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No In-ground Pit Exception? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No H <sub>2</sub> S Prod Facilities Exception? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Require electric pump jack? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

GEOLOGICAL SURVEY  
AUG 26 1997  
Permits & Bonding Unit

<p>21 Source of freshwater:</p> <p><input type="checkbox"/> Surface water    <input type="checkbox"/> Municipal source</p> <p><input type="checkbox"/> Potable well    <input type="checkbox"/> Other</p> <p><input checked="" type="checkbox"/> Exclusive use well</p>							
<p>22 Drilling pit requirements</p> <p>a Use mud tanks only?    <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No</p>							
<p>b Specific placement required?    <input type="checkbox"/> Yes    <input type="checkbox"/> No</p>							
<p>c. Remote pit required?    <input type="checkbox"/> Yes    <input type="checkbox"/> No</p>							
<p>d Salt cuttings to be: (give details)</p> <p><input checked="" type="checkbox"/> Dissolved &amp; removed</p> <p><input type="checkbox"/> Removed for disposal</p> <p><input type="checkbox"/> None</p>							
<p>e District geologist to be notified prior to:</p> <p>Excavation    <input type="checkbox"/> Yes    <input type="checkbox"/> No</p> <p>Liner installation    <input type="checkbox"/> Yes    <input type="checkbox"/> No</p> <p>Encapsulation    <input type="checkbox"/> Yes    <input type="checkbox"/> No</p>	<p>NA</p>						
<p>23 DEQ and/or DNR comments:</p>							
<p>24. Items continued and/or not covered above (attach additional sheets if needed):</p>							
<p>25. Permits needed (describe if applicable):</p> <p><input type="checkbox"/> Land use / well site    <input type="checkbox"/> Wetlands</p> <p><input type="checkbox"/> Stream crossing    <input type="checkbox"/> Other</p> <p><input type="checkbox"/> Soil erosion/sedimentation</p>							
<p>26 Revision included (describe if applicable)</p>							
<p>27. Representative of permittee contacted regarding additional requirements?    <input type="checkbox"/> Yes    <input type="checkbox"/> No</p> <table style="width: 100%; border: none;"> <tr> <td style="border-bottom: 1px solid black; width: 50%;"></td> <td style="border-bottom: 1px solid black; width: 20%;"></td> <td style="border-bottom: 1px solid black; width: 30%;"></td> </tr> <tr> <td style="border: none;">Name</td> <td style="border: none;">Date</td> <td style="border: none;">Phone</td> </tr> </table>					Name	Date	Phone
Name	Date	Phone					
<p>28. Area geologist: recommend a permit:    <input type="checkbox"/> Yes    <input type="checkbox"/> No (provide reasons)    <input type="checkbox"/> Needs corrections or additional information    <input checked="" type="checkbox"/> Memo attached</p> <div style="height: 100px; margin-top: 20px;"> <div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 40%;"> <p style="font-size: 1.2em; font-family: cursive;">Michael J. Moran</p> <p>Signature</p> </div> <div style="width: 40%; text-align: center;"> <p style="font-size: 1.2em; font-family: cursive;">Dist Geol</p> <p>Title</p> </div> <div style="width: 20%; text-align: right;"> <p style="font-size: 1.2em; font-family: cursive;">8/21/97</p> <p>Date</p> </div> </div> </div>							
<p>29 District Geologist: Recommend a permit:    <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No (provide reasons)    <input type="checkbox"/> Needs corrections or additional information    <input type="checkbox"/> Memo attached</p> <div style="height: 100px; margin-top: 20px;"> <div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 40%;"> <p style="font-size: 1.2em; font-family: cursive;">Rick Anderson</p> <p>Signature</p> </div> <div style="width: 40%; text-align: center;"> <p style="font-size: 1.2em; font-family: cursive;">Dist Geol</p> <p>Title</p> </div> <div style="width: 20%; text-align: right;"> <p style="font-size: 1.2em; font-family: cursive;">8/24/97</p> <p>Date</p> </div> </div> </div>							

# DRILLING PERMIT APPLICATION FLOW SHEET

Application Number: <b>mw 970011</b>	Date application received: <b>5/23/97</b>	+ 5 days Date to send to field: <b>5/28/97</b>
Applicant: <b>ICM Kalium</b>		+ 45 days 90 Date to review: <b>8/26/97</b>
Well Name & No: <b>Kalium Hersey #2082</b>		+ 10 days Date to respond: <b>9/9/97</b>
Vendor No: <input type="checkbox"/> New vendor <input type="checkbox"/> Org Chart received		+ 10 bus. days Date to issue permit: <b>9/23/97</b>

## INITIAL REVIEW

Reviewer: **RT**

<input checked="" type="checkbox"/> Fee	<input checked="" type="checkbox"/> Check #, Bank, City <b>#0032293, Royal Bk. of Canada</b>				
	<input type="checkbox"/> Deepening	<input type="checkbox"/> Revision	<input type="checkbox"/> C&T, original permit enclosed		
<input checked="" type="checkbox"/> Complete Application	<input checked="" type="checkbox"/> EQP 7200-1	<input checked="" type="checkbox"/> EQP 7200-2	<input checked="" type="checkbox"/> Supplemental plat	<input checked="" type="checkbox"/> BOP Diagram	
	<input checked="" type="checkbox"/> EIA	<input checked="" type="checkbox"/> Notice to landowner	<input checked="" type="checkbox"/> Directional Plan	<input checked="" type="checkbox"/> Add info <b>H2S plan</b>	
	<input checked="" type="checkbox"/> Bond	<input type="checkbox"/> Single	<input checked="" type="checkbox"/> Blanket	Bond # <b>25K</b>	
<input type="checkbox"/> Natural Features	<input type="checkbox"/> No match found	Program _____		Feature _____	
	<input type="checkbox"/> Match found	Personnel contacted _____		Phone: _____	
<input checked="" type="checkbox"/> Distribution	Area geologist: <input checked="" type="checkbox"/> Cad <input type="checkbox"/> Gay <input type="checkbox"/> B C <input type="checkbox"/> H L <input type="checkbox"/> Shi <input type="checkbox"/> Jac <input type="checkbox"/> Liv <input type="checkbox"/> Pl.				
	District Geologist: <input checked="" type="checkbox"/> Cad <input type="checkbox"/> B C <input type="checkbox"/> Shi <input type="checkbox"/> Pl				
	<input type="checkbox"/> Confidential, copy provided to PGP <input type="checkbox"/> F T. Date <b>6-3-97</b>				
	<input type="checkbox"/> Returned to applicant, date _____				

## REVIEW FOR COMPLETE AND ACCURATE INFORMATION

Reviewer: **WLL**

<input checked="" type="checkbox"/> Location	<input checked="" type="checkbox"/> 7200-1 Deficiencies or conflicts _____				
	<input checked="" type="checkbox"/> 7200-2 Deficiencies or conflicts _____				
	<input checked="" type="checkbox"/> Zoning <b>NONE</b> Residential zoning initial date: _____				
	<input checked="" type="checkbox"/> Posted on map <input type="checkbox"/> Certification of elevations				
<input type="checkbox"/> Drilling Unit	<input checked="" type="checkbox"/> Purpose of well in EIA? Well type: <input type="checkbox"/> Oil/Gas <input type="checkbox"/> BDW <input type="checkbox"/> Gas Storage <input type="checkbox"/> Secy Rec				
<b>MINERAL WELL</b>	<input type="checkbox"/> Spacing addressed in EIA? <input type="checkbox"/> Field spacing order _____				
	<input type="checkbox"/> (A) 14-9-94 <input type="checkbox"/> (A) 3-3-95 <input type="checkbox"/> S O 1-73 <input type="checkbox"/> S O 1-86 <input type="checkbox"/> General Rules				
	<input type="checkbox"/> Approved USP _____ USP Density _____ <input type="checkbox"/> 1320' conflicts _____				
	Spacing conflicts _____				
	<input type="checkbox"/> Voluntary pooling <input type="checkbox"/> Administrative approval <input type="checkbox"/> Pooling documents				
<input checked="" type="checkbox"/> Ownership	<input checked="" type="checkbox"/> Private surface <input type="checkbox"/> Private minerals <input type="checkbox"/> Complete drilling unit <b>SURFACE OWNED BY COMPANY</b>				
	<input type="checkbox"/> State surface <input type="checkbox"/> State minerals <input type="checkbox"/> Open acreage				
	<input type="checkbox"/> Federal surface <input type="checkbox"/> Federal minerals State lease deficiencies _____				
<input checked="" type="checkbox"/> H <sub>2</sub> S	<input type="checkbox"/> Copy to H <sub>2</sub> S Unit <input type="checkbox"/> Sweet				
	<input checked="" type="checkbox"/> Sour, Class _____ <input checked="" type="checkbox"/> Contingency plan enclosed				
<input checked="" type="checkbox"/> Casing & Sealing	<input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Combination <input type="checkbox"/> Cable				
	<input checked="" type="checkbox"/> Int csg S.O. 2-73 <input type="checkbox"/> 30% exception <input type="checkbox"/> Short int exception				
	<input type="checkbox"/> Through Gas Storage S O 1-87 <input type="checkbox"/> Notice to Storage operator				
	<input checked="" type="checkbox"/> SI 1-94 <input checked="" type="checkbox"/> BOP Adequate				
	<input checked="" type="checkbox"/> Deficiencies <b>Added depth to int csg, upgrade wellhead rating</b>				
<input checked="" type="checkbox"/> EIA Review	<input checked="" type="checkbox"/> EIA Part I A-B Deficiencies _____				
	<input checked="" type="checkbox"/> Field review received Recommend issuance <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Field EIA deficiencies _____				
	<input type="checkbox"/> Corrections or additional info from above _____				
	<input type="checkbox"/> Notice to applicant Date _____				
<input type="checkbox"/> Other	<input type="checkbox"/> Public hearing pending _____				
	<input type="checkbox"/> Permits hold _____				
	<input checked="" type="checkbox"/> Other problems, comments from RED <b>no/ppa</b>				

Ready to issue WLL



## GEOLOGICAL SURVEY

## APPLICATION FOR PERMIT TO:

☒ DRILL ☐ DEEPEN  
AND OPERATE A WELL

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

1a. Part 615 Supervisor of Wells

☐ Oil and Gas  
☐ Brine Disposal  
☐ Hydrocarbon Storage  
☐ Injection for Secondary Recovery

1b. Part 625 Mineral Wells

☐ Disposal  
☒ Brine Production  
☐ Test Well  
☐ Storage

1c. Fee enclosed?

☒ Yes  
☐ No, revision of application

2. List all previous permit numbers

3 Fed Employer ID No. or Soc Security No  
38-3545577

4. Conformance bond

☒ Blanket ☐ Single well

5 ☐ Attached

☒ On file

6. Bond number

Bank of Montreal

7 Bond amount

\$25,000

8. Applicant (name of permittee as bonded)

IMC Kalium, Ltd.

9. Address

1395 135th Avenue  
Hersey, MI 49639

Phone

616-832-3755

10. Lease or well name (be as brief as possible)

Kalium Hersey

Well number

2082

11. Surface owner

IMC Kalium, Ltd.

12. Surface location

SE 1/4 of NW 1/4 of SW 1/4 of Sec 26 T 17N R 9W

Township

Hersey

County

Osceola

13. If directional, bottom hole location

NE 1/4 of SW 1/4 of SW 1/4 of Sec 26 T 17N R 9W

Township

Hersey

County

Osceola

14. The surface location for this well is

a 1438 feet from nearest (N/S) south section line AND 1319 feet from nearest (E/W) west section line  
b 1158 feet from nearest (N/S) north quarter section line AND 1319 feet from nearest (E/W) west quarter section line

15. Is this a directional well? ☐ No ☒ Yes If yes complete lines 15 a & b the bottom hole location for this well is

a 839 feet from nearest (N/S) south section line AND 1142 feet from nearest (E/W) west section line  
b. 839 feet from nearest (N/S) south quarter section line AND 1142 feet from nearest (E/W) west quarter section line

16. The bottom hole location (whether straight or directional) of this well is

feet from nearest (N/S) drilling unit line AND feet from nearest (E/W) drilling unit line

17. Kind of tools

☒ Rotary ☐ Cable ☐ Combination

18. Is sour oil or gas expected?

☐ No ☒ Yes ☒ H<sub>2</sub>S Cont. plan enclosed

19. Base of lowest known fresh water aquifer

Formation Drift Depth 800'

20. Intended total depth

MD 8,000' TVD 7,850'

21. Formation at total depth

A-1 Evaporite

22. Producing/injection formation(s)

A-1 Evaporite

23. Objective pool field or project

Hersey Potash

## 24. PROPOSED DRILLING, CASING AND CEMENTING AND SEALING PROGRAM

HOLE			CASING				CEMENT			MUD	
Depth (MD)	Geol. Formation	Bit Dia.	O.D. Size	Wt/Ft	Grade	Condition	Depth (MD)	Sacks	T.O.C.	W.O.C.	Wt. Vis.
900'	Drift	17 1/2"	13 3/8"	48#	J55, New/Used		900'	700	Surf.	16	8.4 27
4,900'	Mass. Anh.	12 1/4"	9 5/8"	40#	K-55, New/Used		4,900'	1,600	Surf.	16	10.2 27
8,000'	A-1 Evap.	8 1/2"	7"	23#	L-80, New		7,950'	500	5,000'	24	10.2 34

25. Send correspondence and permit to

IMC Kalium, Ltd.

Address

1395 135th Avenue Hersey, MI 49639

Phone

616-832-3755

CERTIFICATION "I state that I am authorized by said applicant. This application was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Enclose permit fee of \$100 for a Part 615 oil, gas, or brine disposal well or \$50 for a Part 625 disposal, brine production or storage well. Make checks payable to State of Michigan.

26. Application prepared by (print or type)

Colin Howard

Phone

616-832-3755

27. Signature

Date

5/20/97

DEQ Cashier use only.

Geological Survey Division Use Only.

Permit number

Date issued

Owner number

## GEOLOGICAL SURVEY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION

## APPLICATION FOR PERMIT TO:

☒ DRILL ☐ DEEPEN  
AND OPERATE A WELL

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

1a. Part 615 Supervisor of Wells

☐ Oil and Gas  
☐ Brine Disposal  
☐ Hydrocarbon Storage  
☐ Injection for Secondary Recovery

1b. Part 625 Mineral Wells

☐ Disposal  
☒ Brine Production  
☐ Test Well

1c. Fee enclosed?

☒ Yes  
☐ No, revision of application

2. List all previous permit numbers

3. Fed. Employer ID. No. or Soc. Security No.  
38-3545577

4. Conformance bond

☒ Blanket ☐ Single well5. ☐ Attached☒ On file

6. Bond number P43087C

Bank of Montreal 00008

7. Bond amount

\$25,000

8. Applicant (name of permittee as bonded)

IMC Kalium, Ltd.

9. Address

1395 135th Avenue  
Hersey, MI 49639

Phone

616-832-3755

10. Lease or well name (be as brief as possible)

Kalium Hersey

Well number

2082

11. Surface owner

IMC Kalium, Ltd.

12. Surface location

SE 1/4 of NW 1/4 of SW 1/4 of Sec 26 T 17N R 9W

Township

Hersey

County

Osceola

13. If directional, bottom hole location

NE 1/4 of SW 1/4 of SW 1/4 of Sec 26 T 17N R 9W

Township

Hersey

County

Osceola

14. The surface location for this well is

a. 1438 feet from nearest (N/S) south section line AND 1319 feet from nearest (E/W) west section line

b. 1158 feet from nearest (N/S) north quarter section line AND 1319 feet from nearest (E/W) west quarter section line

15. Is this a directional well? ☐ No ☒ Yes if yes complete lines 15 a & b, the bottom hole location for this well is

a. 538 feet from nearest (N/S) south section line AND 1142 feet from nearest (E/W) west section line

b. 839 feet from nearest (N/S) south quarter section line AND 1142 feet from nearest (E/W) west quarter section line

16. The bottom hole location (whether straight or directional) of this well is

feet from nearest (N/S) drilling unit line AND feet from nearest (E/W) drilling unit line

17. Kind of tools

☒ Rotary ☐ Cable ☐ Combination

18. Is sour oil or gas expected?

☐ No ☒ Yes ☒ H<sub>2</sub>S Cont. plan enclosed

19. Base of lowest known fresh water aquifer

Formation Drift

Depth 800'

20. Intended total depth

MD 8,000' TVD 7,850'

21. Formation at total depth

A-1 Evaporite

22. Producing/injection formation(s)

A-1 Evaporite

23. Objective pool, field or project

Hersey Potash

## 24. PROPOSED DRILLING, CASING AND CEMENTING AND SEALING PROGRAM

HOLE			CASING			CEMENT			MUD	
Depth (MD)	Geol. Formation	Bit Dia.	O.D. Size	W/P: Grade	Condition	Depth (MD)	Sacks	T.O.C.	W.O.C.	Wt. Vls.
900'	Drift	17 1/2"	13 3/8"	48# J55.	New/Used	900'	700	Surf.	16	8.4 27
5000'	AMHERSTBURG	12 1/4"	9 5/8"	40# K-55.	New/Used	5000'	1,600	Surf.	16	10.2 27
8,000'	A-1 Evap.	8 1/2"	7"	23# L-80.	New	7,950'	500	5,000'	24	10.2 34

25. Send correspondence and permit to

IMC Kalium, Ltd.

Address

1395 135th Avenue Hersey, MI 49639

Phone

616-832-3755

CERTIFICATION "I state that I am authorized by said applicant. This application was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Enclose permit fee of \$100 for a Part 615 oil, gas, or brine disposal well, or \$50 for a Part 625 disposal, brine production or storage well. Make checks payable to State of Michigan

26. Application prepared by (print or type)

Colin Howard

Phone

616-832-3755

27. Signature

Date

5/20/97

DEQ Cashier use only.

Geological Survey Division Use Only.

Permit number

Date issued

Owner number

m438

9/9/97

-

## SURVEY RECORD OF WELL LOCATION

This information is required by authority of Part 615 Supervisor of Wells, or Part 625 Mineral Wells, of Act 451 PA 1994, as amended, in order to obtain a drilling permit

Applicant

IMC Kalium, Ltd.

Well name and number

Kalium Hersey #2082

## 1a. Surface location

SE 1/4 of NW 1/4 of SW 1/4 of section 26 T 17N R 9W

Township

Hersey

County

Osceola

## 1b. If this is a directional well, bottom hole location will be

NE 1/4 of SW 1/4 of SW 1/4 of section 26 T 17N R 9W

Township

Hersey

County

Osceola

**Instructions:** Outline drilling unit for oil/gas wells (Part 615) or property boundary for mineral wells (Part 625) and spot well location on plat shown. Locate the well in two directions from the nearest section, quarter section, and unit (or property, Part 625) lines

## 2. The surface location is

1438 ft from nearest (N/S) south section line

1319 ft from nearest (E/W) west section line

and

1158 ft from nearest (N/S) north quarter section line

1319 ft. from nearest (E/W) west quarter section line

## 3. Bottom hole will be (if directional)

839 ft from nearest (N/S) south section line

1142 ft from nearest (E/W) west section line  
and

839 ft from nearest (N/S) south quarter section line

1142 ft. from nearest (E/W) west quarter section line

## 4 Bottom hole will be (directional or straight)

ft. from nearest (N/S) drilling unit line

ft. from nearest (E/W) drilling unit line

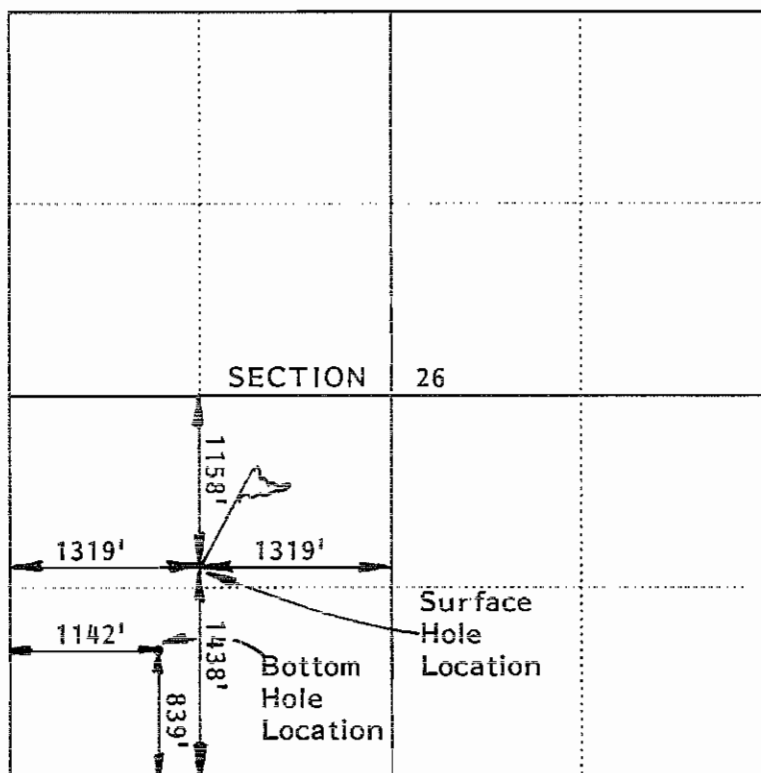
5. Show access to stake on plat and describe if it is not readily accessible. Site can be reached from the East, off of 135th Avenue, along an existing access road to the site

## 6 Zoning

- ☐ Residential, effective date \_\_\_\_\_  
initial date of residential zoning \_\_\_\_\_  
☒ Other None in effect

PLAT BELOW REPRESENTS ONE FULL SECTION  
(1 MILE SQUARE)

N ↑



ON SEPARATE PLAT OR PLOT PLAN, LOCATE, IDENTIFY AND SHOW DISTANCES TO:

- A. All roads, power lines, buildings, residences, fresh water wells, and other man-made features, within 600 feet of the stake.  
B. All lakes, streams, wetlands, drainage-ways, floodplains, environmentally sensitive areas, natural rivers, critical dune areas, and threatened or endangered species within 1320 feet of the stake.  
C. All type I and II public water supply wells within 2000 feet and all type IIb and III public water supply wells within 800 feet of the well stake.

Name of individual who surveyed site

J. Dean Geers, Prof. Surveyor

Company

Wilcox Associates, Inc.

Date of survey

Address No. 33977

7711 S. US-131 P.O. Box 580 Cadillac, MI 49601

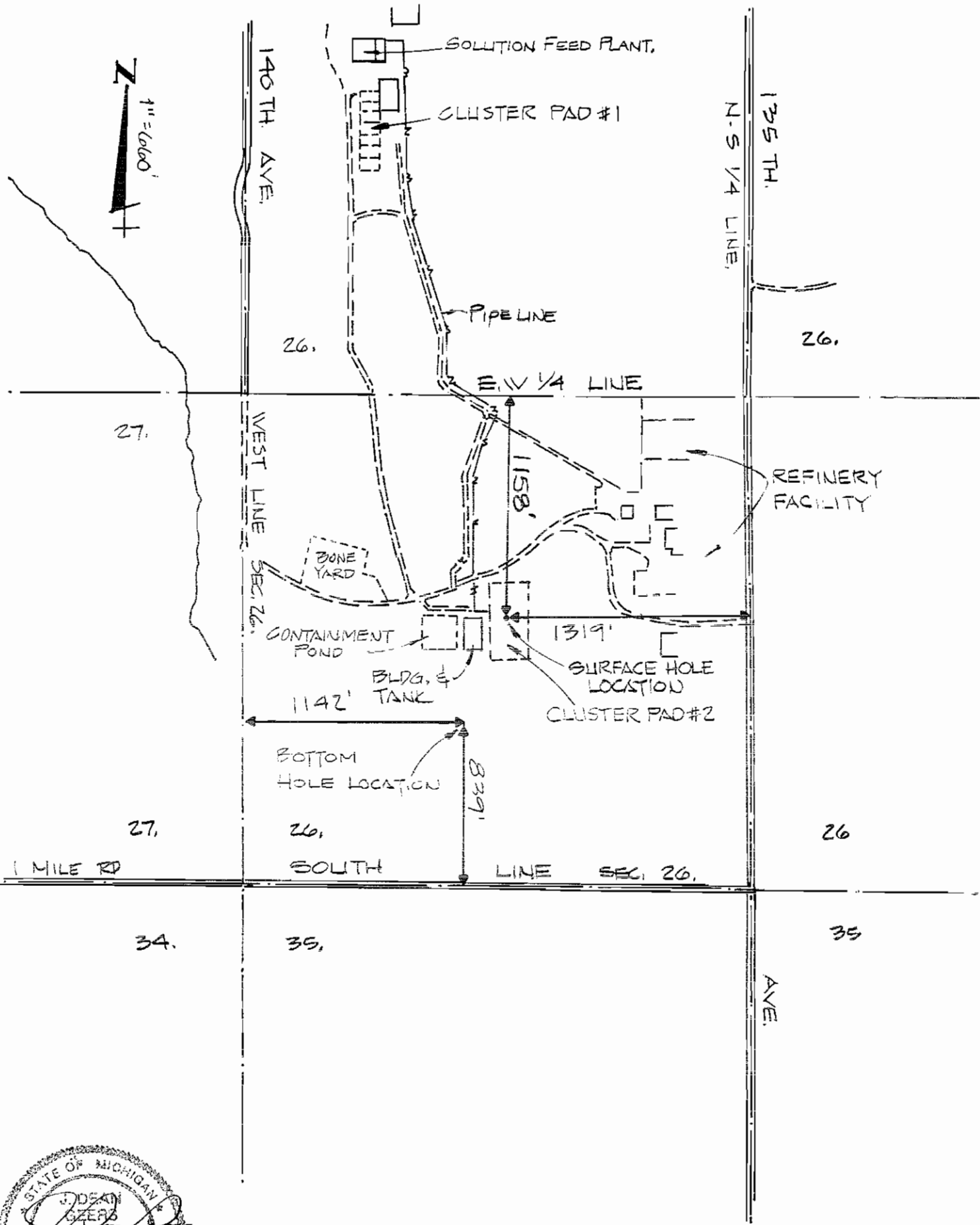
Phone 616-775-7755

I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Signature of licensed surveyor (affix seal)

Date

5-9-97



SUPPLEMENTAL PLAT- KALIUM  
 HERSEY # 2082 - SEC. 26, T17N, R9W.  
 HERSEY TOWNSHIP.  
 OSCEOLA COUNTY, MICHIGAN.  
 CLIENT: I.M.C. KALIUM LTD.

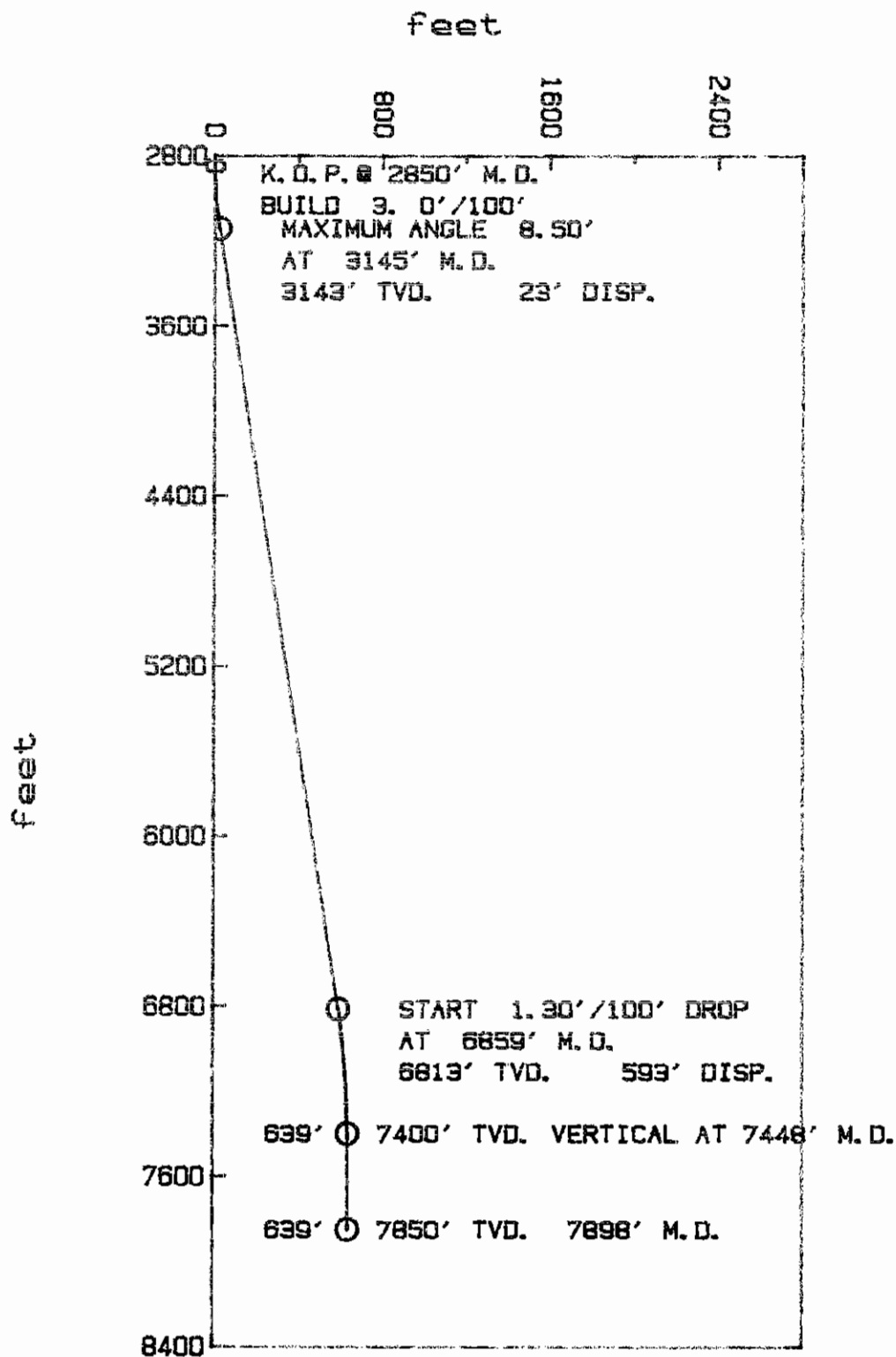
DATE 5-7-97		Wilcox Associates	
DRN. HAW	CHD JDG	Engineering Surveying and Environmental Sciences	
SCALE V: 1"=660'	NOTES F.B. PG. ~	SHEET 1 OF 1	JOB NO 97244

7711 South US 131  
 P.O. Box 580  
 Cadillac, MI 49601  
 616 775-7755



IMC KALIUM  
KALIUM HERSEY # 2082  
HERSEY TOWNSHIP , OSCEOLA COUNTY

VERTICAL SECTION 1 IN. = 800 FT.



IMC KALIUM

OBJECTIVE NO. 1:

KALIUM HERSEY # 2082  
HERSEY TOWNSHIP , OSCEOLA COUNTY

639' S15.16'W OF  
SURFACE LOCATION  
7448' M.D. 7400' TVD.  
616' SOUTH 168' WEST

PLAN VIEW  
1 IN. = 200 FT.

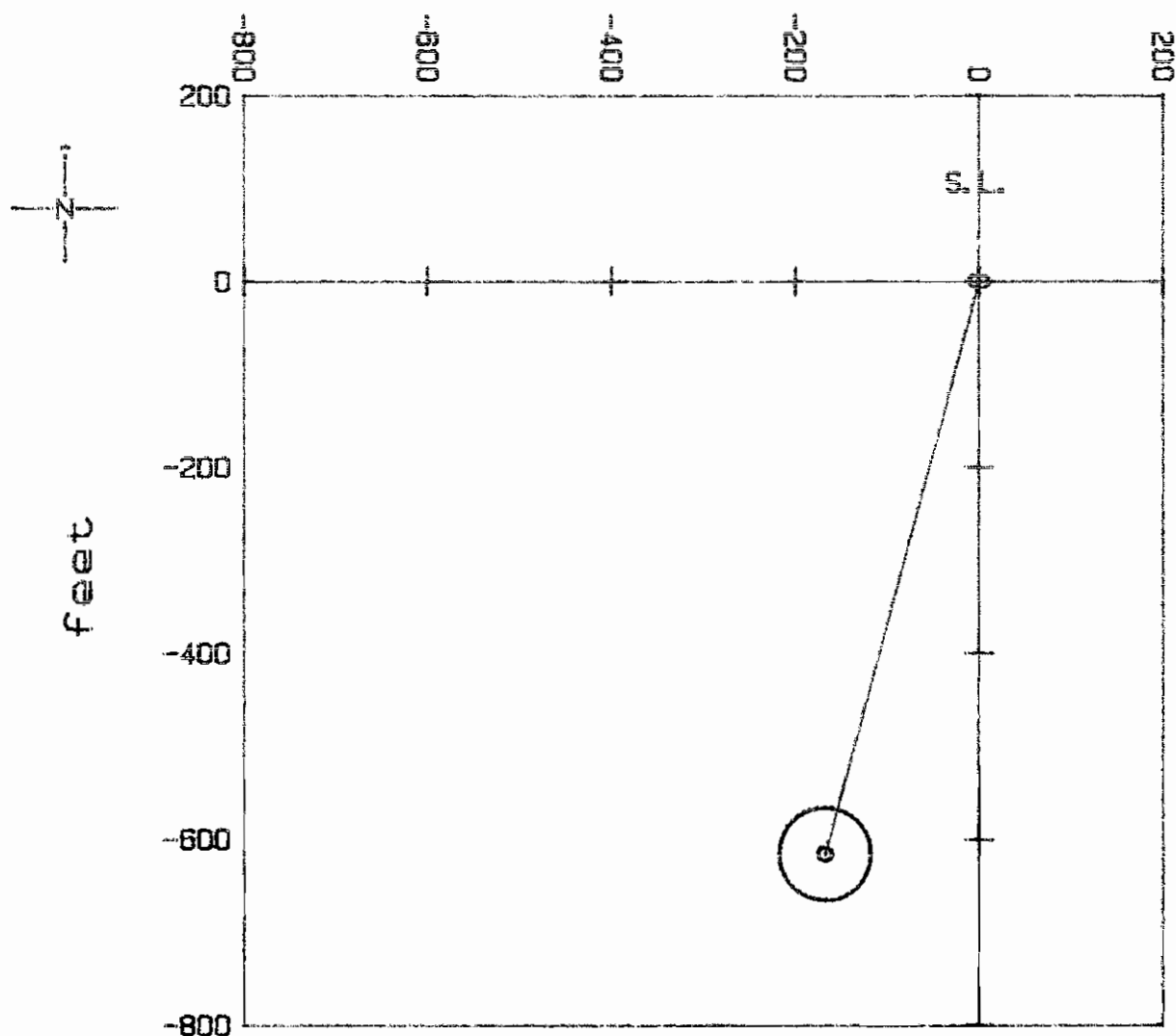
OBJECTIVE NO. 2:

639' S15.16'W OF  
SURFACE LOCATION  
7898' M.D. 7850' TVD.

SUBMITTED BY:

Directional Drilling Contractors, Inc.

50' RADIUS TARGET  
feet





## IMC Kalium Chemicals Ltd.

1395 135th Ave.  
Hersey, MI 49639



To: Permits and Bonding Unit  
Geological Survey Division  
Department of Environmental Quality  
P.O. Box 30256,  
Lansing, MI 48909-7756

Date: May 14, 1997

### Casing and Cementing Procedures Kalium Hersey 2082

1. Conductor pipe of 30" diameter will be driven to refusal for this well. (usually 80-90 feet) Surface hole will be drilled with a 17 1/2" bit, 100 feet into the competent rocks of the Michigan Group at a depth of approximately 900 feet. The exact depth will be determined by a certified geologist. New or fully inspected used 13 3/8", 48#/ft., J55 seamless casing will be run to bottom with a Texas pattern shoe. The bottom three joints of casing will be strapped across the collars in three sections. The casing will be cemented with returns to surface. Wait on cement time will be 16 hours.

2. The 12 1/4" intermediate hole will be directionally drilled to 100 feet below the base of the Detroit River Salt at a true vertical depth of approximately 4900 feet, as local drilling shows no lost circulation zones deeper. Intermediate casing, new or fully inspected used 9 5/8" 40#/ft., J or K55, seamless casing will be set at this depth and two stage cemented to surface as per cementers recommendations in line with accepted cementing practices. Wait on cement time will be 16 hours.

3. The 8 1/2" production hole will be drilled into the A-1 Evaporite to a true vertical depth of approximately 7850 feet. The primary objective of this well is the evaluation and production of the potassium chloride and sodium chloride mineralization of the A-1 Evaporite. The evaluation program will consist of coring of appropriate sections of the A-1 Evaporite as well as appropriate geophysical logs. Production casing will be new 7", 23#/ft., L80 seamless casing set in the A-1 Evaporite and cemented back to 5000 feet with premium cement. Wait on cement time will be 24 hours.

4. After well operations cease, it will be plugged and abandoned according to Department of Environmental Quality requirements.

Colin D. Howard  
Production Geologist

**ENVIRONMENTAL IMPACT ASSESSMENT**

Required for issuance of well permit pursuant to Part 615, 1994 PA 451, as amended. Falsification of this information may result in fines and/or imprisonment. Check all boxes and fill in all blanks which apply to this drilling application. Attach additional pages as necessary.

**A. DESCRIPTION OF PROJECT**

<b>1. Applicant's name</b> IMC Kalium, Ltd.	<b>Well name and number</b> Kalium Hersey #2082								
<b>2. Intended use of well</b> Development of potash from the A-1 Evaporite									
<b>3. Applicable spacing order and drilling unit size</b> <table style="width: 100%;"><tr><td><input type="checkbox"/> S.O. 14-9-94 N. Mich. Antrim, 80 acres</td><td><input type="checkbox"/> S.O. 3-3-95 S. Mich. Antrim, 40 acres</td></tr><tr><td><input type="checkbox"/> S.O. 1-73 Niagaran, 80 acres</td><td><input type="checkbox"/> S.O. 2-81 Oakland Co. Niagaran, 40 acres</td></tr><tr><td><input type="checkbox"/> R 324.301 General rule, 40 acres</td><td><input type="checkbox"/> S.O. 1-86 P.D.C., 640 acres</td></tr><tr><td colspan="2"><input type="checkbox"/> Field Spacing or Unitization Order (identify)</td></tr></table>		<input type="checkbox"/> S.O. 14-9-94 N. Mich. Antrim, 80 acres	<input type="checkbox"/> S.O. 3-3-95 S. Mich. Antrim, 40 acres	<input type="checkbox"/> S.O. 1-73 Niagaran, 80 acres	<input type="checkbox"/> S.O. 2-81 Oakland Co. Niagaran, 40 acres	<input type="checkbox"/> R 324.301 General rule, 40 acres	<input type="checkbox"/> S.O. 1-86 P.D.C., 640 acres	<input type="checkbox"/> Field Spacing or Unitization Order (identify)	
<input type="checkbox"/> S.O. 14-9-94 N. Mich. Antrim, 80 acres	<input type="checkbox"/> S.O. 3-3-95 S. Mich. Antrim, 40 acres								
<input type="checkbox"/> S.O. 1-73 Niagaran, 80 acres	<input type="checkbox"/> S.O. 2-81 Oakland Co. Niagaran, 40 acres								
<input type="checkbox"/> R 324.301 General rule, 40 acres	<input type="checkbox"/> S.O. 1-86 P.D.C., 640 acres								
<input type="checkbox"/> Field Spacing or Unitization Order (identify)									
<input type="checkbox"/> Antrim USP (identify name, number of acres, and number of drilled and permitted wells)									
<input type="checkbox"/> Administrative exception requested per Rule 324.303 <input type="checkbox"/> Subsection 2 or <input type="checkbox"/> Subsection 3 Enclose voluntary pooling agreement and plans for development									
<input type="checkbox"/> Exception to spacing requested, petition for hearing filed									
<input checked="" type="checkbox"/> Non-producing well, no drilling unit									
<b>4. Applicant's right to drill and produce</b> Are all mineral interests in the drilling unit under lease and controlled by the applicant/permittee? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable, non-producing well <input type="checkbox"/> If no, petition filed for compulsory pooling OR <input type="checkbox"/> If no, attach certified efforts to obtain leases.									
<b>5. Special considerations</b> <input type="checkbox"/> Replacement well for permit no _____ <input checked="" type="checkbox"/> Existing well pad <input type="checkbox"/> Other (describe) _____									

**B. IMPACTS AS A RESULT OF DRILLING**

<b>1. Dimensions</b> of drill pad <u>N/A</u> x <u>N/A</u>	of access roads <u>N/A</u> x <u>N/A</u>
Describe access route to well during drilling <u>From the intersection of 135th Avenue and One Mile Road, then north along 135th approximately 0.25 miles to the Kalium Facility access road, then westerly approx. 0.25 miles through facility to the existing Cluster #2 Pad and well site.</u>	
<b>2. Describe the topography</b> Identify the direction of and percentage of slope(s): _____	
a. At the well site <u>Existing well pad. No earthwork will be needed.</u>	
b. Along the access to well site - <u>there will be no new access trail needed.</u>	
<b>3. Describe the land cover (type, density, species of trees) and present land use:</b>	
a. At the well site - <u>Existing well pad. No cover. Land use is commercial.</u>	
b. Along access to well site - <u>no new access needed. Land use is commercial.</u>	
<b>4. Identify the distance and direction to any of the following:</b>	
a. All buildings, fresh water wells, public roads, powerlines and other man-made features within 600' of the well site: <u>There are no residences or fresh water wells within 600' of the wellsite. The Kalium Processing Facility lies on land around Cluster #2 Pad.</u>	
b. All Type I and Type IIa public water supply wells within 2000'	
<u>None</u>	
c. All Type II b and Type III public water supply wells within 800' of the well site.	
<u>None</u>	
Type I is a community water supply with year-round service ≥ 15 living units or ≥ 25 residents. Type II is a non-community water supply with ≥ 15 service connections or ≥ 25 individuals for not less than 60 days per year. Average daily water production: IIA ≥ 20,000 GPD IIB <20,000 GPD. Type III is a public water supply which is neither type I or II.	

Part B-4 continued

d. Surface waters, floodplains, wetlands, natural rivers, critical dune areas, threatened or endangered species within 1320' of the well site: None

Are all items in part B-4 are shown on the supplemental plot? ☒ Yes ☐ No

If not, why? \_\_\_\_\_

**5. Identify the source of fresh water used to drill this well**

- ☐ "Permanent" water well, to be retained after final completion OR used for drinking water (shall be drilled and installed pursuant to Part 127 of 1979 PA 368, as amended).
- ☐ "Temporary" water well, will be plugged upon final completion and not used for drinking water (consult R 324.403 (2) for minimum construction requirements).
- ☒ Fresh water will be hauled from existing water well or municipal source (identify): Located at Kalium Facility
- ☐ No fresh water will be used in drilling this well.

**6. Handling and disposal of drill cuttings and muds**

- ☐ On site in-ground pit, anticipated dimensions: L \_\_\_\_\_ W \_\_\_\_\_ D \_\_\_\_\_
- ☐ Remote in-ground pit, anticipated dimensions: L \_\_\_\_\_ W \_\_\_\_\_ D \_\_\_\_\_  
Attach approval of landowner and attach survey of remote pit location
- ☐ Temporary pit, cuttings and muds disposed at (identify) \_\_\_\_\_
- ☒ No in-ground pit, cuttings and muds disposed at (identify) Northern Oaks Landfill
- ☐ Depth to ground water expected 0'- 4' below the base of pit
- ☐ Pit will be solidified.
- ☐ Existing pits on location - identify location \_\_\_\_\_

**C. IMPACTS AS A RESULT OF PRODUCTION**

**1. Kind of well** ☐ exploratory ☒ development ☐ Antrim project

**2. Location of surface facilities** (Refer to R 324.103 (m))

- ☐ Greater than 300' from wellhead at \_\_\_\_\_  $\frac{1}{4}$ , \_\_\_\_\_  $\frac{1}{4}$ , \_\_\_\_\_  $\frac{1}{4}$ , Sec \_\_\_\_\_, T \_\_\_\_\_, R \_\_\_\_\_ (complete C-3)
- ☒ Surface facility exists or was previously approved for construction and is known as IMC Kalium Potash Fac. (omit C-3)
- ☐ EIA for surface facility is found in another document (Identify where it is found) \_\_\_\_\_ (omit C-3)
- ☐ Surface facility and all flowlines are within 300' of the wellhead (omit C-3)
- ☐ Surface facility location was not determined for this **exploratory** well (omit C-3). A separate request for surface facility location approval, which will include an Environmental Impact Assessment as well as a Soil Erosion and Sedimentation Control Plan, will be submitted to District Geologist prior to construction pursuant to R 324.504.

**3. Surface facility Environmental Impact Assessment** (describe or attach supplemental plot identifying the following)

- a. Dimensions of surface facility: \_\_\_\_\_
- b. Access route to the surface facility \_\_\_\_\_
- c. Route of flow lines from well(s) to surface facility \_\_\_\_\_
- d. Topography, direction, and percentage of slopes at the surface facility \_\_\_\_\_

Part C-3 continued

e. Land cover and present land use at surface facility \_\_\_\_\_

f. Distance and direction to all buildings, fresh water wells, public roads, power lines and other man-made features within 600' of surface facility \_\_\_\_\_

g. Distance and direction to any surface waters, floodplains, wetlands, natural rivers, critical dune areas threatened or endangered species within 1320' of the surface facility site. \_\_\_\_\_

h. Distance and direction to all Type I and Type IIa public water supply wells within 2000' of the surface facility site and all Type IIb and Type III wells within 800' of the surface facility \_\_\_\_\_

Type I is a community water supply with year-round service  $\geq 15$  living units or  $\geq 25$  residents. Type II is a non-community water supply with  $\geq 15$  service connections or  $\geq 25$  individuals for not less than 60 days per year. Average daily water production: IIA  $\geq 20,000$  GPD IIB  $< 20,000$  GPD Type III is a public water supply which is neither type I or II.

**4. Method of brine disposal**

- ☐ Dedicated flow line to \_\_\_\_\_ disposal well, permit number \_\_\_\_\_
- ☐ Tanked and hauled to disposal well.
- ☒ Other Used in production process (Salt refinery)

**5. Method of transporting hydrocarbons past the point of sale**

- ☐ Oil sold through transmission line ☐ Gas sold through transmission line
- ☐ Oil tanked and hauled ☐ Gas flared on site (production restrictions may apply)

**D. MITIGATION OF IMPACTS FROM DRILLING AND/OR PRODUCTION**

Describe measures to be taken to protect environmental and/or land use values

Site is an existing well pad with containment measures, which will be maintained and utilized for potash development

for years in the future.

**E. ATTACH SOIL EROSION AND SEDIMENTATION PLAN**

(FORM 7200-18) (REFER TO REQUIREMENTS UNDER PART 91 1994 PA 451 )

**F. ALTERNATE WELL AND SURFACE FACILITY LOCATIONS**

Were alternate surface locations considered for this well or surface facility?

- ☒ No, alternate sites did not seem necessary or more desirable
- ☐ Yes, the following locations were considered \_\_\_\_\_

Why were they rejected in favor of the proposed location? \_\_\_\_\_

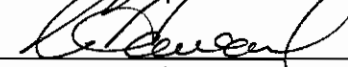
**CERTIFICATION** "I state that I am authorized by said applicant to prepare this document. It was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Colin Howard

Name and title (printed or typed)

PRODUCTION GEOLOGIST

Authorized Signature



Date

5/20/97

ENCLOSE WITH APPLICATION FOR PERMIT TO DRILL

**SOIL EROSION & SEDIMENTATION  
CONTROL PLAN**

By authority of Part 91, and Part 615 or Part 625 of Act 451 PA  
1994, as amended Non-submission and/or falsification of this  
information may result in fines and/or imprisonment

☐ Part 615 Oil/Gas Well ☒ Part 625 Mineral Well

1 Name and address of applicant

IMC Kalium, Ltd.  
1395 135th Avenue  
Hersey, MI 49639

Phone: (616)832-3755

Fax: ( )

2 Well or project name:

Kalium Hersey #2082

3 Well or project location:

Section(s) 26

T17N

R9W

4 Name and address of County or local Enforcement Agent (CEA)

Osceola County Soil Erosion Control

Courthouse

301 W. Upton Avenue

Reed City, MI 49677

Phone: (616) 832-3261

Fax: ( )

5 Township

Hersey

6 County

Osceola

7 Date earth changes expected to start

Not Applicable

8 Date of expected completion

Not Applicable

9 Name and address of person responsible for earth change:

Not Applicable

10 Name and address of person responsible for maintenance:

Not Applicable

Phone: ( )

Fax: ( )

Phone: ( )

Fax: ( )

11 Send copies of supplemental plat required by Part 615, R 324 201(2)(b) or R 324 504(4), and this form and all attachments to CEA

Date sent to CEA 5/20/97

**EARTH CHANGE ACTIVITIES**

12. Project description: (Project activities may be permitted sequentially.)

a Number of well sites N/A, N/A acresd. Flow line(s) trenched in off well site\* N/A feet, N/A acresb Number of surface facility sites N/A, N/A acrese Flow line(s) plowed in off well site\* N/A feet, N/A acresc. New access roads N/A feet, N/A acres

\*Contact CEA for fee schedule

13 Describe sites for which permits are being sought under Part 301 (Inland Lakes & Streams) NoneDescribe sites for which permits are being sought under Part 303 (Wetlands) None

List file numbers if known

14 Areas requiring control structures

Will earth changes occur in areas with slopes of 10% or greater; areas where runoff water is likely, such as runs greater than 500' of moderate slope (5% to 10%), narrow valley bottoms etc.; areas within 500' of a lake or stream; or other areas where sedimentation to a wetland or drainage way may occur?

☐ Yes Attach detail map at scale of 1"=200' or larger, with contour lines at a minimum of 20' intervals OR percent slope descriptions.

Also indicate any of the following erosion control structures that will be utilized Identify location on map and attach detail plan

Indicate on plan whether erosion control structures are temporary or permanent

☐ Diversions ☐ Culverts ☐ Sediment basins ☐ Silt fences ☐ Rip-rap ☐ Berms ☐ Check dams ☐ Other☒ No

15. Site restoration

☐ Topsoil will be segregated from subsoil and stockpiled OR ☐ No topsoil on site☐ Recontour and revegetate as soon as weather permits Seed mix Not Applicable☐ Describe other proposed methods of restoration

16 Application prepared by (name)

Colin Howard

Signature

Date

**FOR USE OF COUNTY OR LOCAL ENFORCING AGENT**

INSTRUCTIONS TO COUNTY OR LOCAL ENFORCMENT AGENT: Return this form to the applicable field or district office of the Geological Survey Division within 30 days of receipt Explain reasons for recommendation or disapproval and conditions required for approval Include copies of any revisions to the plan

17 Comments

☐ Conducted on site inspection

Date

☐ Inspected site with representative of applicant

Date

18 ☐ Approved ☐ Disapproved

CEA signature

Date

## WELLHEAD BLOWOUT CONTROL SYSTEM

Worksheet supplement for "Application for Permit to Drill or Deepen a Well"

This information is required by authority of Part 615  
Supervisor of Wells or Part 625 Mineral Wells, Act 451  
PA 1994, as amended, in order to obtain a permit.

Applicant

IMC Kalium, Ltd.

Well name and number

Kalium Hersey #2082

Max. anticipated surface pressure 1,000#Annular B.O.P. 13 3/8" 5000#W.P.

B.O.P.  
☐ Manual  
☒ Hydraulic  
☒ Sour Trim

B.O.P. Pipe Rams 13 3/8" 5000#W.P.  
(Pipe/Blind)B.O.P. Blind Rams 13 3/8" 5000#W.P.Check Valve 2" 5000# W.P.

(Pipe/Blind)

Valve 3" 5000# W.P.Valve 2" 5000# W.P.Valve 2" 5000#W.P.Valve 3" 5000# W.P.

Kill Line Manifold

Manifold Line

Spool 13 3/8" 5000# W.P.Line 2" 5000# W.P.Wellhead 3000# W.P.

Fill above blanks with applicable information. If not applicable, enter "N A." or cross-out item shown.  
Describe test pressures and procedure for conducting pressure test. Identify any exceptions to R324 406 being requested.

Blowout prevention equipment will be tested to a pressure commensurate with the expected formation pressure, but not less than 1,000 psig at surface, for not less than 20 minutes before drilling the plug on the surface casing, intermediate casing and the production casing and before encountering all high-pressure formations and at other intervals as approved or requested by the Supervisor of Wells.



**SOUR GAS CONTINGENCY PLAN - PART II**  
**IMC KALIUM, LTD.**  
**KALIUM HERSEY #2082**  
**SECTION 26, T17N, R9W**  
**HERSEY TOWNSHIP, OSCEOLA COUNTY, MICHIGAN**

**RESIDENTS WITHIN 1/4 MILE OF WELLSITE**

1 IMC Kalium, Ltd  
Refinery  
Phone: 616-832-3755

**EMERGENCY TELEPHONE NUMBERS**

<u>Name</u>	<u>Location</u>	<u>Number</u>
Kalium Company Personnel		
Mr Rob Plosz	Hersey, MI (Office)	616-832-3755
Mr Paul McMillen	Hersey, MI (Office)	616-832-3755
MDEQ		
Cadillac District Geologist	Cadillac, MI	616-775-3960
Mr Ray Vugrinovich	Lansing (Office)	517-334-6945
	Lansing (Home)	517-339-9547
Sheriff	Osceola County	911
State Police	Cadillac, MI or Big Rapids, MI	911 616-832-2221
Ambulance / Emergency	Osceola County	911
Hospital	Reed City Hospital 7665 S. 220th Avenue Reed City, Michigan	911 or 616-832-3271
Director of Emergency Services		
Dallas Jenks	Osceola County (Office) or in an emergency	616-832-6172 911
Fire Department	Osceola County	911

Pollution Emergency Alerting System (PEAS)

800-292-4706

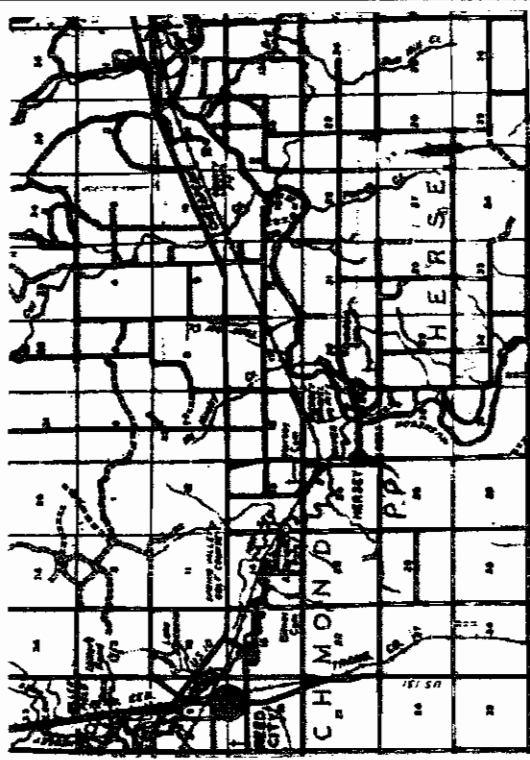
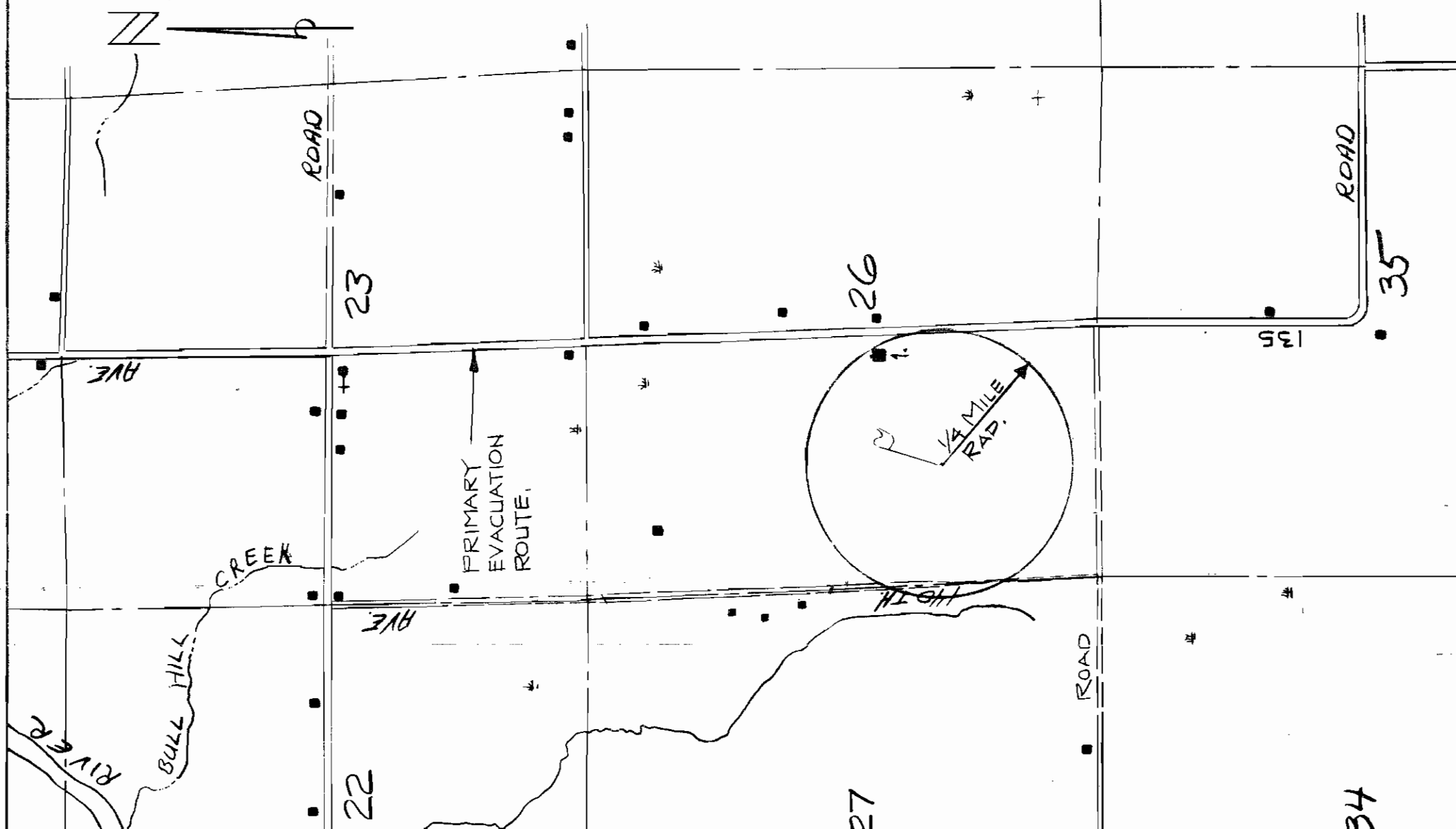
**NEAREST PUBLIC TELEPHONE**

The nearest public telephone is located in front of the General Store in the Village of Hersey. This is located approximately 1/4 mile east to 135th Avenue, then north on 135th Avenue approximately 3/4 mile, then west approximately 4-1/2 miles on Hersey Road to 180th Avenue.

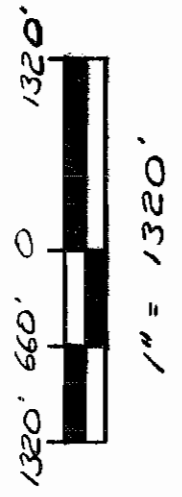
**MUD TREATMENT**

A gas buster will be provided

**Note:** For locations of residences, public gathering places, and evacuation routes, see Vicinity Map.



PROJECT LOCATION  
LOCATION MAP  
NO SCALE



LEGEND

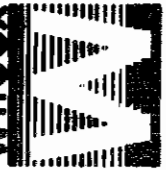
P.P. = PUBLIC TELEPHONE

SCALE NO.	END DATE
D.S. ENCL.	DATE
TOPOG. ENCL.	DESIGN
PROFILE ENCL.	ENCL. ENCL.
APPROVED F.H.T.	SCALE V: 1/4" = 1320'

MAP DEPICTING RESIDENCES, PUBLIC  
GATHERING PLACES AND EVACUATION  
ROUTE @ KALUIM HERSEY #2082  
SECTION 26 T17N, R20W,  
HERSEY TOWNSHIP,  
OSCEOLA COUNTY, MICHIGAN

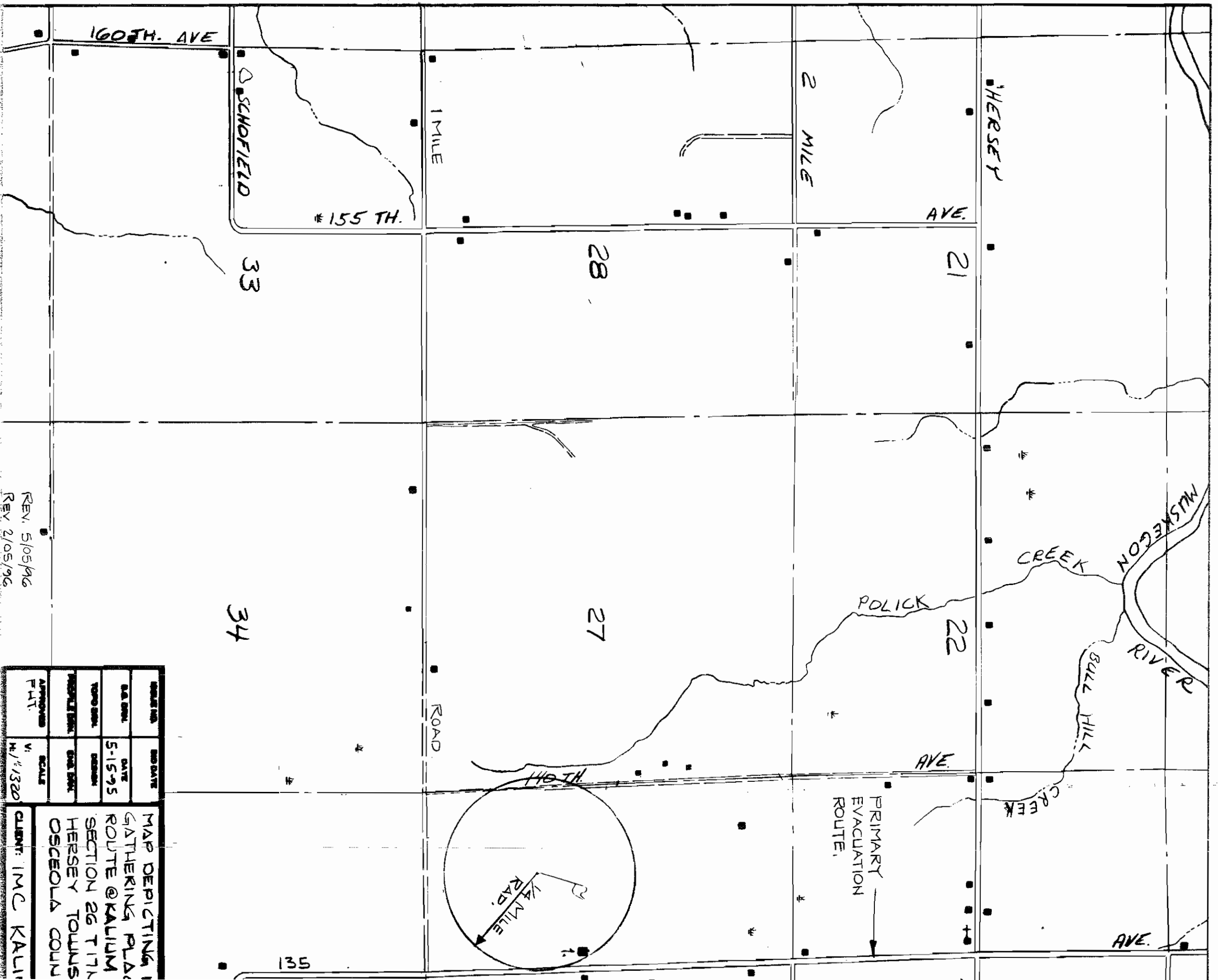
CLIENT: IMC KALUIM, LTD.

Wilcox Associates, Inc.



7711 South U.S. 131  
P. O. Box 580  
Cadillac, MI 49801  
818 775-7755

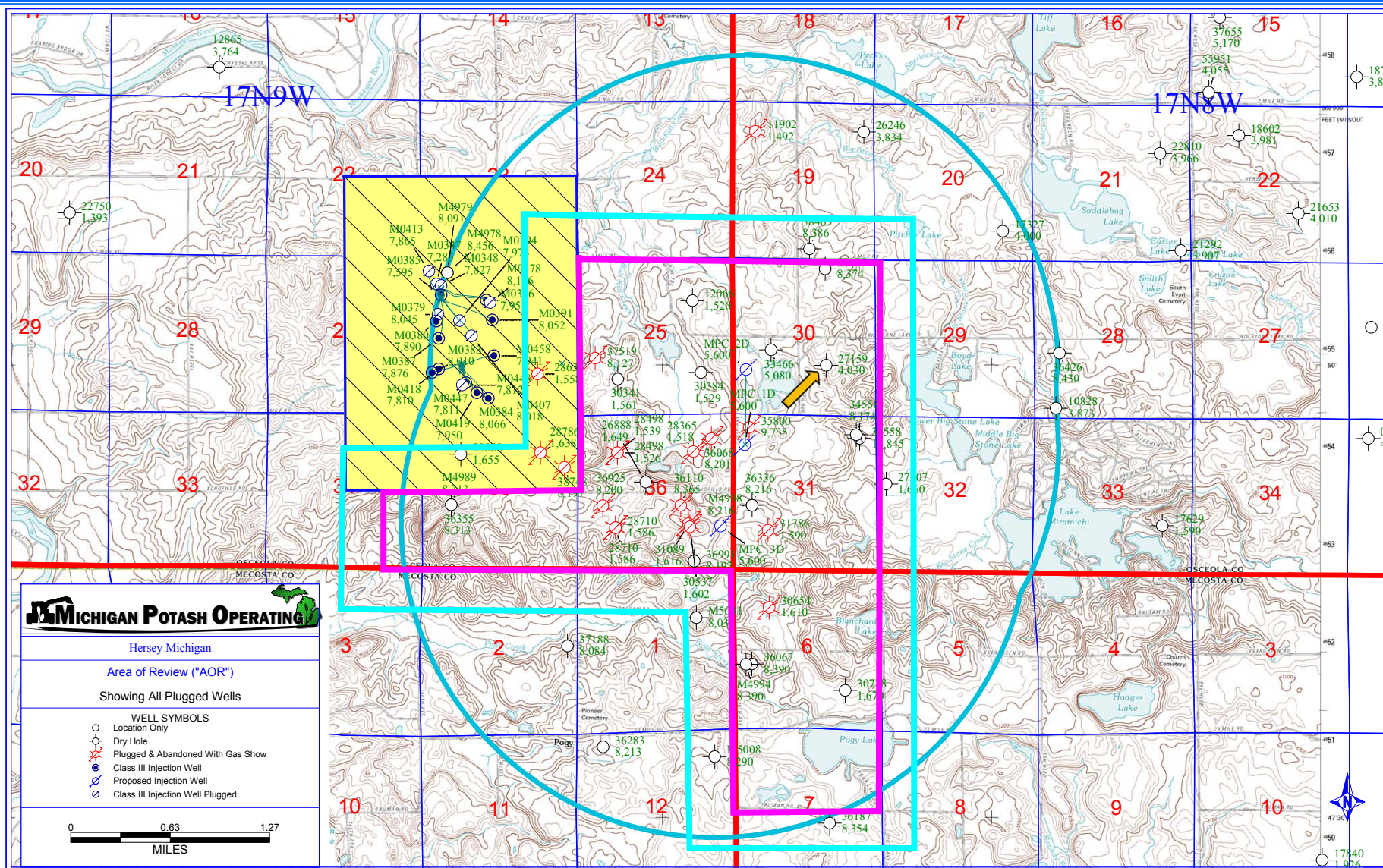
TOPOG. LEVELS	P.L.	SHEET	JOB NO.
		1 of 1	97244



REV. 5/05/96  
REV. 2/05/96

SCALE 1/4"	END DATE	MAP DEPICTING
S.D. 5001	DATE	GATHERING PLD.
TOWN 5001	5-15-95	ROUTE @ KALUM
POLICK 5001	DESIGN	SECTION 26 T17K
HERSEY 5001	SCALE	HERSEY TOWNS
APPROVED	SCALE	OSCEOLA COUN
P.H.T.	VI 1/4" 1320	CLIENT: IMC KALU

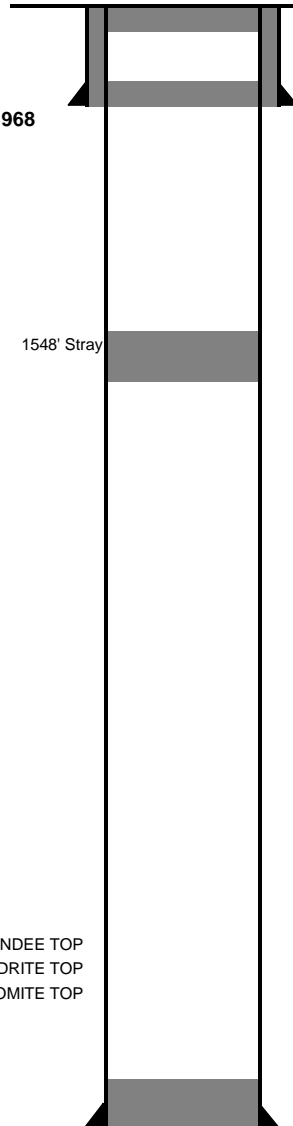




**MADDERN 1**  
**SE NW SE Sec 30 T17N R8W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

PERMIT No. 27159  
API No. 21-133-27159-00-00  
GL @ 1146'  
KB @ 1161'  
WELL COMPLETION DATE: 2/27/1968  
PLUGGING COMPLETION DATE: 2/27/1968

UPDATED APRIL 2014 BY JLT



**SURFACE CASING**

8-5/8", 32#/ft.  
SET @ 914' KB  
500 SX CMT + 20 SX in top of cellar

**PLUGGING**

Run drill pipe to TD (4030') and spot 35 SX CMT on bottom.  
Pull drill pipe to 1600', spot 35 SX CMT through Stray.  
Pull drill pipe to base of the 8-5/8" surface pipe, spot 20 SX CMT  
Pull remainder of drill pipe.  
8-5/8" surface pipe abandoned with the well.  
Cut pipe off 3' below ground level, spot 5 SX CMT.

# MADDERN 1 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
1/31/1968	SPUD.
2/22/1968	DRILLING COMPLETED.
	8 5/8" SET AT 914'; 500 SX CMT + 20 SX in top of cellar
2/12/1968	Run drill pipe to TD (4030') and spot 35 SX CMT on bottom.
2/27/1968	Pull drill pipe to 1600', spot 35 SX CMT through Stray.
	Pull drill pipe to base of the 8-5/8" surface pipe, spot 20 SX CMT
	Pull remainder of drill pipe.
	8-5/8" surface pipe abandoned with the well.
	Cut pipe off 3' below ground level, spot 5 SX CMT.
2/27/1968	PLUGGING COMPLETED



# APPLICATION FOR PERMIT TO DRILL A WELL FOR OIL, GAS, GEOLOGICAL TEST, BRINE DISPOSAL, GAS OR L.P.G. STORAGE OR FOR SECONDARY RECOVERY

UNDER AUTHORITY OF ACT 61, P.A. OF 1939, AS AMENDED, AND ACT 326, P.A. OF 1937, AS AMENDED.

STATE OF MICHIGAN  
SUPERVISOR OF WELLS  
GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF CONSERVATION  
LANSING, MICHIGAN 48926

See Reverse Side Before Filling Out This Application



LOCATE WELL AND OUTLINE LEASE OR UNIT ON SECTION PLAT - 640 ACRES

14. ACRES IN LEASE OR UNIT (SPECIFY)  
40-Acre Unit

1. APPLICATION TO DRILL A WELL FOR:  
GAS OR OIL

2. DATE  
1-18-58

3. FEE ENCLOSED  
\$ 25.00

4. LESSEE (OWNER OF LEASE RIGHTS)

Michigan Consolidated Gas Company

5. PERMANENT ADDRESS

One Woodward Avenue, Detroit, Michigan 48226

6. PHONE

313 + 964-8000

7. LESSOR (FULL NAME OF OWNER OF MINERAL RIGHTS)

H. MADDOX

8. WELL NO.

1

9. SURFACE OWNER (IF OTHER THAN MINERAL OWNER)

10. DRILLING CONTRACTOR

Company

11. ADDRESS

Reed City, Michigan

12. PHONE

616 + 832-5651

13.

SE 1/4 of NW 1/4 of SE 1/4 Section 30 T 17N R 8W

15. TOWNSHIP

Evart

16. COUNTY

Osceola

17. Locate well in two directions from nearest line of quarter section and property ownership or unit lines

940 FT. FROM North LINE OF QUARTER SECTION  
(north-south)  
940 FT. FROM North (PROPERTY LINE)  
(north-south)

990 FT. FROM West LINE OF QUARTER SECTION  
(east-west)  
330 FT. FROM East (PROPERTY LINE)  
(east-west)

18. KIND OF TOOLS TO BE USED

(Cable, rotary, combination) - Rotary

19. WELL IS TO BE

COMPLETED IN

Reed City Zone

FORMATION

20. INTENDED DEPTH OF WELL

3900 feet

21. PROGRAM OF CASING, SEALING, CEMENTING AND COMPLETING WELL

Approximately 700 feet of 8-5/8 inch casing will be set and cemented to surface. If productive, 5 1/2 inch casing will be set through the productive zone and cemented. Proper wellhead control equipment will be used while drilling and completing well.

CASING IS NOT TO BE STRIPPED FROM THE HOLE AND NO CHANGE IS TO BE MADE IN THE PROGRAM OUTLINED ABOVE WITHOUT APPROVAL OF THE SUPERVISOR OF WELLS OR HIS AUTHORIZED REPRESENTATIVE

22. ARE THERE ANY LAKES, STREAMS, DRAINAGE DYES, SWAMPS, OR MARSHES NEARER THAN 300 FEET FROM WELL LOCATION?

Yes ☐ No ☒

23. ARE THERE ANY BUILDINGS OR OTHER STRUCTURES WITHIN 75 FEET OF THE PROPOSED LOCATION?

Yes ☐ No ☒

24. IF ANSWER TO NO. 22 ABOVE IS YES, DESCRIBE AND GIVE DISTANCE FROM LOCATION.

APPLICANT AGREES TO COMPLY WITH THE PROVISIONS OF ACT 61, PUBLIC ACTS OF 1939, AS AMENDED, AND ACT 326, PUBLIC ACTS OF 1937, AS AMENDED, AND RULES AND REGULATIONS PERTAINING TO THE LOCATING, DRILLING, CASING, SEALING, COMPLETING, PRODUCING, AND PLUGGING OF WELLS. BEFORE COMMENCING DRILLING OPERATIONS, CONTACT THE NEAREST FIELD OFFICE. (See reverse side)

25. ADDRESS CORRESPONDENCE H. O. Ankerberg, Michigan Consolidated Gas Company  
AND PERMIT TO Route 2, Box 103-B, Reed City, Michigan

26. PHONE

616 + 832-5651

LEAVE BLANK

DATE ISSUED

PERMIT NO.

27. OWNER OF

LEASE RIGHTS

28. AUTHORIZED

REPRESENTATIVE

MICHIGAN CONSOLIDATED GAS COMPANY

John A. Vary - JAV

DISTRIBUTION

FOR CASHIER'S USE ONLY - DO NOT WRITE IN THIS SPACE

1. WHITE - LANSING  
2. CANARY - CASHIER  
3. BLUE - FIELD

4. GOLDENROD - FIELD  
5. GREEN - APPLICANT

1052 3 V - - - 11 502526 87-61-LV

PERMIT DIVISION - BOX 30028 - LANSING, MI 48902



STATE OF MICHIGAN  
DEPARTMENT OF CONSERVATION No. 8935  
SUPERVISOR OF WELLS

**PERMIT TO DRILL A WELL FOR OIL OR GAS**

(POST WHITE COPY OF PERMIT AT WELL LOCATION)

Permit No. 27159

Date Issued January 22, 1968

Permission is hereby granted to

Michigan Consolidated Gas Company

Owner

One Woodward Avenue, Detroit, Michigan 48226

Address

Lessee Name H. Haddorn

Well Number One

To drill a well for

Gas and Oil

In the SE 1/4 SE 1/4 of Section 30, T.17N., R.8W., Ewart Twp., Oceola Co.

and located 940' from the north and 990' from the west line of quarter section.

and located 940' from the north and 330' from the east property line

This permit is issued subject to the provisions and requirements of Act 61, P. A. 1939 and Act No. 328, P. A. 1937, as amended, and rules, regulations, requirements, or orders issued by the Supervisor of Wells and Department of Conservation.

GERALD E. EDDY, SUPERVISOR OF WELLS

By Robert M. Ackers

**SPECIAL REQUIREMENTS**

**NOTICE**

DRILLING PERMIT ISSUED on the basis of the drilling, casing and sealing program as outlined on the application for permit and subject to special requirements as set forth above. No change or alteration is to be made without the permission and approval of the Supervisor of Wells or his authorized representative.

DRILLING OPERATIONS ARE NOT TO BE COMMENCED until all the well location requirements have been completed and the permit has been posted in a conspicuous place at the well site.

**DEPARTMENT OFFICES**

Lansing, Phone 517-373-1256  
Mount Pleasant, Phone 517-773-8691  
Cadillac, Phone 616-775-3181

Plainwell, Phone 616-683-8031  
Imley City, Phone 313-724-7015  
Escanaba, Phone 906-786-0333

PERMITS MAY BE TRANSFERRED ONLY WITH THE PERMISSION OF  
THE SUPERVISOR OF WELLS

-3-

MICHIGAN DEPARTMENT OF CONSERVATION  
GEOLOGICAL SURVEY DIVISION

SURVEY RECORD OF WELL LOCATION

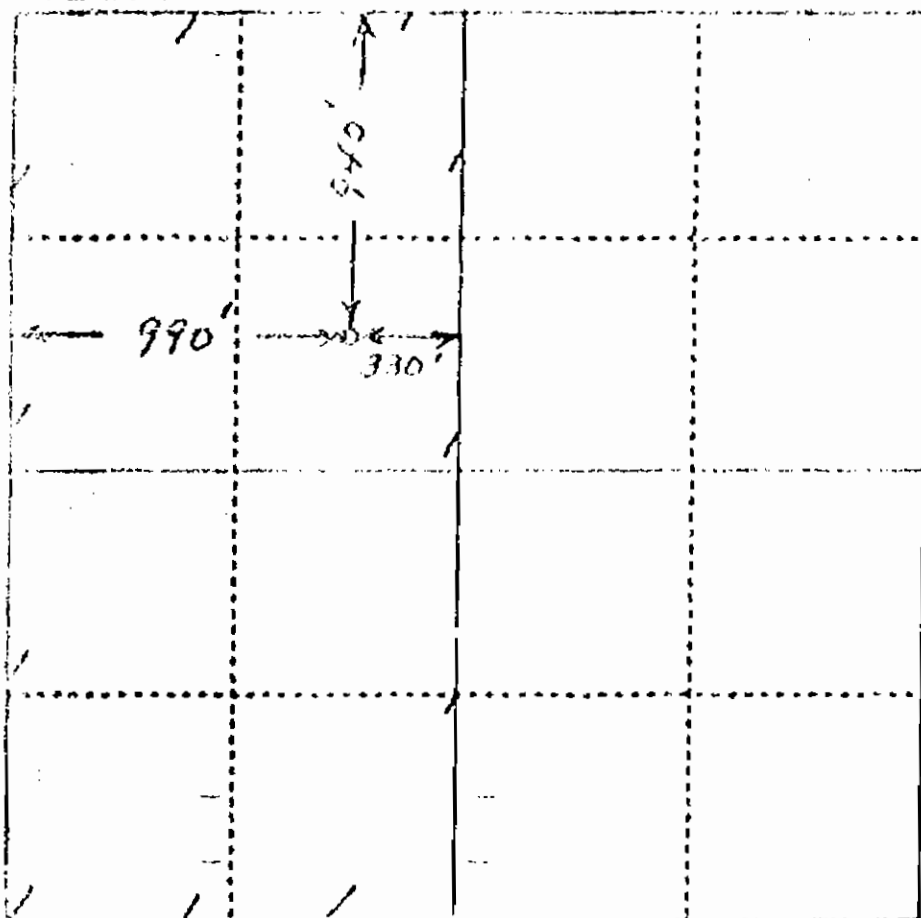
(Submit in triplicate with Application for Permit to Drill a Well for Oil, Gas,  
Geological Test, Brine Disposal, or Key Well for Secondary Recovery)

Operator Michigan Consolidated Gas Co.

Well Name H. M. Mason

Number 1

Location Description SE 1/4 of NW 1/4 of SE 1/4 of Section 30, T 17 N 8 W  
Quarter Section (160 acres more or less)



(Scale of plat = 1 inch equals 660 feet)

1. Locate well site and show acreage in lease.
2. Locate well in two directions from nearest quarter section lines and from nearest lease or ownership property lines.

940 ft. from North line of quarter section.  
(north-south)

990 ft. from West line of quarter section.  
(east-west)

940 ft. from North lease or property line.  
(north-south)

330 ft. from East lease or property line.  
(east-west)

3. Is location staked? yes  
If location is not staked, describe how it is identified

4. Type of land and cover Open grass land  
(open farm land, grass, brush, timber, etc.)

5. Are any lakes, streams, swamps, drainageways, etc., within 300 feet of well site? no If yes, locate on survey plat, show distance from site and give brief description. This location was staked 50' north of regular location because of sidehill conditions.

6. Are any roads, power lines, regularly used buildings, etc., within 75 feet of well site? no If yes, locate on survey plat, show distance from site and give brief description.

Surveyed by Michigan Elevation Service

January 10, 1968

Address of Surveyor John W. Dwyer

CERTIFICATION: I certify the above information is complete and I swore to the best of my knowledge and belief.

MICHIGAN CONSOLIDATED GAS COMPANY

Owner of Lease Rights

January 18, 1968

Signature

John A. Vary-JRE  
Authorized Representative

Date

APR 8

## WELL LOCATION REPORT

Permit No. 22159Operator Michigan Consolidated Gas Co.Farm Name H. Madden #1Notification M.C.G.C. called to inform concerning drilling.Nature of Location Open grass land.Condition of Pits OK.Distance from Water No water.

Remarks Location on top of a steep grade. Moved stake 50' north to give better  
clearance. Approval given after completing well. Well completed Feb. 22, 1968  
— a dry hole.

Approved by

Russell Niles

Date

April 3, 1968

DIVISION

BOX 50128

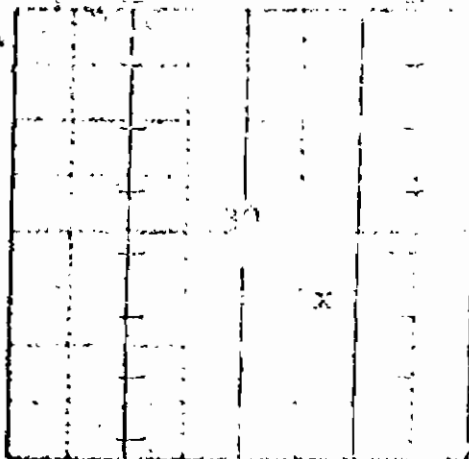
DIVISION

BOX 50128

MAR 2 1968

# LOG OF OIL, GAS OR TEST WELL

TO BE FILED WITH SUPERVISOR OF WELLS WITHIN 30 DAYS  
AFTER COMPLETION OF WELL (ACT 81 P. A. 1958  
AND ACT 282 P. A. 1957)



LOCATE WELL APPROXIMATELY

Drill No. 27159

Deepening No.

Owner or Operator Michigan Consolidated Gas Company

Address One Woodward Avenue - Detroit, Michigan 48226

Well Name J. M. Madden

Township Ewart

County Osceola

R.B. 1160

Location SE NW SE

Sec 30

Top 176

Range 6W

Elevation ORN 1145.5

Footage 940

North

line and 990

West

line of quarter section

Type of well Dry Hole

Total depth 1025

(TD) (ST)

Completed in Reed City Formation

Name of producing formation

Top of formation

Date drilling

Date drilling

Date well

began Jan 31, 1968

completed February 22, 1968

completed February 27, 1968

Drilling contractor Michigan Consolidated Gas Co Address One Woodward Avenue - Detroit, Michigan

## WATER ZONES

## OIL OR GAS ZONES

## DEVIATION SURVEY

NAME	FROM	TO	AMOUNT	RUN AT	DEGREES

## CASING AND CEMENTING

## STEEL LINES RUN

SIZE	WHERE SET	CEMENT	WT. PULLED	RUN AT	CORRECTED TO	RUN BY
8-5/8"	224'	500		31497	No Correction	Strapped Drill Pipe

## PERFORATIONS

## ACID OR SHOOTING RECORD

DATE	FROM	TO	NO. HOLES	DATE	FROM	TO	GAL. ACID OR OIL, NITRO

Motary tools from 0 feet to 1030 feet. Cable tools from  feet to  feet.

Natural initial production first 24 hours 12.1. After acid or shot  Bbls.

If gas well, cu ft. per 24 hours  . Back pressure, lbs. per sq. in.  .

The above information is complete and correct.

Signed R.O. Ankerberg  
Drilling Supt.

Date 3/19/68

GIVE COMPLETE FORMATION RECORD ON REVERSE SIDE

(Submit in Duplicate)

MAR 22 1959

T.D. 4030 feet  
in Reed City Zone30-17N-3W  
Evert Twp., (Oscoda Co.)

#1 Maddern

Michigan Consolidated Gas Company

Permit #27159

Drilling Contractor: Michigan Consolidated Gas Company (Rig #1)

Location: SE NW SE Section 31-17N-3W  
940' from North line and 920' from West line of Quarter Section

Elevation: 1160 R.B. 1157 R.F. 1145.5 G.M.

Record By: Gordon Biebee from rig samples and driller's log

Driller's Log

		PLEISTOCENE:
0 -	75	Clay
75 -	252	Drift, clay, with sand streaks
252 -	565	Clay and Gravel
565 -	592	Shale, gray
		PERMIAN:
		Red Beds:
592 -	625	Red clay and gypsum
625 -	645	Limestone, shells and gypsum
		MISSISSIPPIAN:
		Saginaw Series:
645 -	790	Clay and sand

Sample Description:

790 -	800	Shale, reddish brown, sticky, sand and gravel contamination
800 -	810	Shale, reddish brown, plastic, soft
810 -	820	Shale as above; Clay, gray
820 -	830	Shale 60% reddish as above; Sandstone 40% gray, 0.1 to 0.2 MM grain size, subrounded, medium cemented with dolomite, well sorted
830 -	840	Free sand grains 80%, and some pieces of Sandstone, frosted, 0.2 to 0.4 MM grain size, subrounded, sample looks gray; Shale 20% dark gray
840 -	850	Shale 60% dark gray; Dolomite 10% dark brown, microcrystalline trace; Sandstone 30% gray, 0.1 MM grain size, subrounded - well cemented with dolomite, white
850 -	860	Shale, dark gray; Sandstone, off white, 0.1 to 0.25 MM grain size, fair sorting, subrounded, poorly cemented; Sandstone seems to be interbedded with Shale, gray and Siltstone, gray
860 -	870	As above, slight increase Sandstone
870 -	900	Sandstone, off white, 0.1 to 0.2 MM grain size, subangular, well sorted, fair cemented with dolomite, Shale, trace, gray
900 -	915	Sandstone, off white and free sand grains, 0.1 to 0.3 MM grain size, subrounded, fair cemented with dolomite, medium sorted
915 -	920	Shale 50% gray, silty; Siltstone 50% gray
920 -	930	Sandstone, off white 70%, 0.1 to 0.15 MM grain size, subangular, well sorted, fair cemented with lime; Shale 30% gray



Parma Sandstone:  
930 - 950 Shale 50% black, hard; Sandstone 40% off white, 0.2 to 0.4 MM grain size, subrounded, poorly cemented with dolomite, poor sorting, porous; Dolomite 10% tan to brown, microcrystalline, sandy  
950 - 960 Sandstone, off white, 0.1 MM grain size, well sorted, subangular, well cemented with white dolomite; Dolomite, trace, brown, very finely sucrosic  
960 - 970 Shale, black  
970 - 990 Shale, dark gray; Dolomite, trace, brown, microcrystalline  
990 - 1000 Shale, light gray, hard, silty  
1000 - 1010 Shale as above; Dolomite 10% buff to brown, microcrystalline  
1010 - 1100 Shale, dark gray; Dolomite, trace, buff to brown, microcrystalline  
1100 - 1150 Shale, dark gray

# MISSISSIPPIAN:

## Bayport Limestone:

1190 - 1200 Limestone, brown, microcrystalline, many included sand grains  
1200 - 1210 Limestone, brown  
1210 - 1220 Limestone 60% brown; Sandstone 40% off white, 0.2 to 0.8 MM grain size, subangular, medium cemented with lime, medium sorted  
1220 - 1230 Limestone, brown; Shale, gray; Sandstone, trace as above

## Michigan Series:

1230 - 1240 Shale 70% gray; Anhydrite 30% white; Dolomite, trace, gray, microcrystalline  
1240 - 1250 Shale, gray; Anhydrite 20% white  
1250 - 1300 Shale 75% gray; Anhydrite 20-25% white  
1300 - 1350 Shale, gray; Anhydrite 20-25% white and pink  
1350 - 1370 As above, increase Anhydrite, pink

## Triple Gypsum: 1366 (SJ)

1370 - 1380 Anhydrite, white  
1380 - 1390 Anhydrite 50% white; Shale 50% gray  
1390 - 1395 Shale 70% gray; Anhydrite 30% white  
1395 - 1400 Shale 80% gray; Anhydrite 20% white  
1400 - 1410 Shale 60% gray; Anhydrite 40% white  
1410 - 1415 Shale 75% gray; Anhydrite 25% white  
1415 - 1420 Shale 85% gray; Anhydrite 15% white  
1420 - 1425 Shale 90% gray; Anhydrite 10% white  
1425 - 1430 Shale 75% gray; Anhydrite 25% white  
1430 - 1435 Shale 65% gray; Anhydrite 15% white; Dolomite 20% brown, microcrystalline  
1435 - 1440 Shale 80% gray; Dolomite, trace as above; Anhydrite 20% white

## Brown Limestone: 1440 (SJ)

1440 - 1445 Anhydrite 80% white; Shale, trace, gray; Limestone 20% brown, microcrystalline  
1445 - 1450 Dolomite 85% brown, finely sucrosic; Anhydrite 15% white; Shale, trace, gray  
1450 - 1455 Dolomite, brown as above; Anhydrite, trace, white; Shale, trace, gray  
1455 - 1460 Dolomite 80% brown as above; Shale 20% gray  
1460 - 1465 Dolomite 70% brown; Shale 30% gray  
1465 - 1470 Shale 80% gray; Dolomite 20% brown, microcrystalline; Anhydrite, trace, white

1470 - 1475 Shale, gray; Anhydrite 20% white  
 1475 - 1480 Shale 80% gray; Sandstone 20% gray; Anhydrite, trace, white  
 1480 - 1485 Sandstone 40% off white, 0.15 to 0.4 MM grain size, angular, poorly sorted, fair cemented with lime; Shale 60% gray  
 1485 - 1490 Sandstone 50% as above; Shale 50% gray  
 1490 - 1500 No Samples  
 1500 - 1505 Shale 70% gray; Anhydrite 30% white  
 1505 - 1510 Shale 90% gray; Anhydrite 10% white  
 1510 - 1515 Anhydrite, white; Shale, trace, white  
 1515 - 1530 Shale 90% gray; Anhydrite 10% white  
 1530 - 1535 Anhydrite 50% white; Shale 50% gray  
 1535 - 1540 Shale 60% gray; Anhydrite 40% white; Dolomite, trace, brown, microcrystalline  
 1540 - 1545 Sandstone 30% green, 0.15 to 0.2 MM grain size, subangular, well cemented with dolomite, well sorted; Shale 50% gray; Anhydrite 20% white; Dolomite, trace, brown, microcrystalline  
 1545 - 1550 Stray Sandstone: 1548 (SJ)  
 Sandstone 50% gray, 0.15 to 0.2 MM grain size, subangular, well sorted, medium cemented with lime; Shale 50% dark gray  
 1550 - 1555 Sandstone as above  
 DST #1: 1524-1556  
 Gas to surface 3 mins.  
 Flow Time: 1st 30 mins 2nd 60 mins.  
 CIP Time: 1st 60 mins 2nd 180 mins.  
 IHFP 739.1 FHFP 759.1  
 IGIP 578 FGIP 578  
 IFP 66.3 - 94.7  
 FFP 94.7 - 90  
 Tool opened with good blow for 30 mins.  
 Int. Flow rotated dual CIP Valve for a 60 min. Int. CIP.  
 Reopened tool with good blow for 60 mins. Second Flow closed dual CIP valve for 180 mins FGIP.  
 Recovered: 100' drilling fluid and 500 MCF gas  
 1555 - 1560 Sandstone, gray as above  
 1560 - 1565 Shale, gray  
 1565 - 1580 Sandstone 60% gray; Shale 40% gray  
 1580 - 1600 Sandstone, red, 0.15 to 0.25 MM grain size, subangular and subrounded, fair cemented with dolomite, well sorted  
 1600 - 1615 Sandstone, red as above, mostly free sand grains  
 1615 - 1620 Sandstone as above, becoming shaley  
 1620 - 1625 Sandstone 60% as above; Shale 40% red, soft, plastic  
 1625 - 1640 Shale, red, plastic; Some Sandstone, red  
 1640 - 1650 Shale, gray, plastic; some sand grains  
 1650 - 1660 As above  
 1660 - 1700 Sandstone, gray, 0.15 to 0.3 MM grain size, subangular and subrounded, fair sorting, fair cemented with dolomite  
 1700 - 1715 As above  
 1715 - 1725 Free sand grains, gray and red, frosted, 0.15 to 0.3 MM grain size, subangular  
 1725 - 1765 Free sand grains as above, mostly reddish grains, 0.2 to 0.5 MM size, subangular  
 1765 - 1785 Free sand grains, red, silty, 0.1 MM grain size, subangular

1785 - 1790	Free 40% sand grains as above; Free sand 20% grains, gray, coarse, subangular; Shale 40% gray
1790 - 1795	Free sand grains 60%, red, fine grained; Free sand grains 10%, coarse, subangular; Shale 30% gray
1795 - 1815	Free sand grains 80%, red, fine grained; Free sand grains 20%, coarse, subangular
1815 - 1835	Sandstone 70% reddish, silty, very fine grained; Shale 30% reddish, silty
1835 - 1845	Shale, gray, medium hard
1845 - 1870	Sandstone, reddish, silty, very fine grained, limy, micaceous
Cohawater:	
1870 - 2100	Shale 90% gray; Limestone 10% brown, microcrystalline
2100 - 2230	Shale 90% gray; Dolomite 10-20% gray and brown, microcrystalline
2230 - 2240	Shale 70% gray; Dolomite 30% brown, limy, microcrystalline
2240 - 2270	Shale 80% gray; Dolomite 20% as above
2270 - 2350	Shale 90% gray; Dolomite 10% as above
2350 - 2360	Shale 80% gray; Dolomite 20% brown, microcrystalline
2360 - 2650	Shale 90% gray; Dolomite 10% brown, microcrystalline
Sunbury:	
2650 - 2660	Shale 50% black, hard; Limestone 20% cream, microcrystalline; Shale 30% gray
2660 - 2670	Shale 60% black; Limestone 30% cream; Shale 10% gray
2670 - 2700	As above, fossil fragments
2700 - 2710	Shale 60% black, hard; Limestone 20% cream to gray, microcrystalline; Shale 20% gray
2710 - 2730	Shale 70% black; Limestone 30% as above
2730 - 2740	Shale, black, hard
DEVONIAN:	
Ellsworth:	
2740 - 2750	Shale 60% black; Shale 40% gray green, hard
2750 - 2800	Shale 70% gray green; Shale 30% light brown
2800 - 2870	Shale, gray green and some light brown
2870 - 2900	As above, slight increase Shale, light brown
2900 - 2940	Shale 50% gray green; Shale 50% light brown
2940 - 2950	Shale 60% light brown; Shale 40% gray green
2950 - 3000	Shale 80% light brown; Shale 20% gray-green
3000 - 3020	Shale 90% light brown; Shale 10% gray green
Antrim:	
3020 - 3165	Shale, dark brown, blackish, hard
3165 - 3170	Limestone 20% brown, microcrystalline; Shale 20% dark brown as above; Limestone, trace, cream, microcrystalline
3170 - 3175	Shale 70% dark brown; Limestone 30% brown as above
3175 - 3180	Limestone 60% brown as above; Shale, dark brown
3180 - 3185	Limestone 50% brown as above; Shale 20% dark brown
3185 - 3190	Shale 80% dark brown; Limestone 20% brown, as above
3190 - 3200	As above
3200 - 3210	Shale 90% dark brown; Limestone 10% as above
3210 - 3275	Shale, dark brown
Traverse Formation: 3250 (BJ)	
3275 - 3285	Shale, dark brown (more of a gray color); Shale, trace, gray, limy; Limestone, trace, white, microcrystalline



3285 - 3295 Limestone, gray-brown, microcrystalline; Shale, gray brown, limy  
3295 - 3305 Limestone, brown, microcrystalline, shaley

Traverse Limestone: 3304 (SJ)

3305 - 3310 Limestone, brown, very finely sucrosic to microcrystalline

30 min. Circulated Sample at 3310:

Limestone, brown, finely sucrosic

3310 - 3315 Limestone, brown, sucrosic

3315 - 3320 Limestone, gray-brown, sucrosic

3320 - 3325 Limestone, brown, sucrosic

3325 - 3330 Limestone, brown, sucrosic; Shale, trace, grayish

30 min. Circulated Sample at 3330:

Limestone, brown, sucrosic; Shale 30% grayish

3330 - 3335 Limestone 40% black, microcrystalline; Shale 40% gray brown;

Limestone 20% brown, sucrosic

3335 - 3340 Limestone, off white, microcrystalline, fragmental

3340 - 3345 Limestone, off white and buff, fragmental, sucrosic, cherty

3345 - 3350 Limestone, buff to cream, fragmental

3350 - 3355 Limestone, buff to brown, sucrosic

3355 - 3360 Limestone, buff to brown, sucrosic

3360 - 3365 Limestone, tan to brown, some buff to off white, sucrosic

3365 - 3370 Limestone, tan to brown, sucrosic

3370 - 3375 Limestone, off white, sucrosic

3375 - 3380 Limestone 80% off white, sucrosic; Limestone 20% cream to buff

3380 - 3385 Limestone, buff to tan, sucrosic

3385 - 3390 Limestone, brown, sucrosic

3390 - 3395 Limestone 70% brown, sucrosic; Limestone 30% buff to tan

3395 - 3400 Limestone, light brown, sucrosic; Limestone, trace, off white to buff

3400 - 3405 Limestone 50% dark brown to black, microcrystalline; Limestone 50% tan to brown, sucrosic

3405 - 3410 Limestone 60% off white, sucrosic; Limestone 40% black, microcrystalline

3410 - 3415 Limestone 70% buff to tan, sucrosic; Limestone 20% black, microcrystalline; Shale 10% gray

3415 - 3420 As above, darker color

3420 - 3425 As above plus Shale, gray

3425 - 3430 Limestone, brown, finely sucrosic; Limestone, trace, off white, sucrosic

Ball Shale: 3834 (SJ)

3840 - 3850 Limestone 50% as above; Shale 50% gray

3850 - 3860 As above, quite shaley

3860 - 3870 Shale, gray

Dandee: 3890 (SJ)

Circulated Sample at 3896:

Limestone, off white to tan to brown mottled, fragmental, finely sucrosic, fossiliferous; Shale, gray

3895 - 3900 Limestone as above; Shale, gray

3900 - 3910 Limestone as above

min. Circulated Sample at 3910:  
Limestone, buff to brown as above

3910 = 3960

Limestone as above, buff to brown mottled

3960 = 3970

Reed City Anhydrite: 3953 (S)  
Limestone 60% or above; Dolomite 40% buff to gray, finely  
sugrosic

3970 = 3975

Reed City Dolomite: 3968 (E)  
Dolomite, dark brown, sugrosic; Dolomite, gray, microcrystalline  
to finely sugrosic; Anhydrite, trace, white?

3975 = 3980

Dolomite, brown, finely sugrosic

3980 = 3985

As above; Anhydrite, trace, white?

3985 = 3990

Dolomite, brown, sugrosic; Chert, trace, white; Anhydrite,  
trace, white?

3990 = 3995

Dolomite, cream, dense, tight

3995 = 4000

Dolomite, tan, dense, tight

4000 = 4025

Dolomite, as above, trace Dolomite, brown to dark brown, micro-  
sugrosic, tight

4025 = 4030

Dolomite, brown to dark brown, fine to microcrystalline, tight

4030 TOTAL DEPTH (DRILLER)

4025 TOTAL DEPTH (S)

7273  
10/67

MICHIGAN DEPARTMENT OF CONSERVATION

## WELL PLUGGING RECORD

TO BE FILED WITHIN THIRTY DAYS AFTER PLUGGING IS COMPLETED

MAY 21 1968

MAY 24 1968

Well No. 21152 Date March 19, 1968Owner or Operator Michigan Consolidated Gas Co. Address One Woodward Avenue - Detroit, MichiganWell Name H. Madden No. 1 Location NE NW SE Section 22Township East County Cape T. 17N R. 8WType of Well Dry Hole Total Depth 4030 TD Formation Reed City  
(OIL, GAS, BRINE DISPOSAL OR DRY HOLE)Date Plugging Started February 27, 1968 Date Plugging Completed February 27, 1968Was permission of Department of Conservation obtained before plugging began? YesName of Department representative who authorized or supervised plugging Russell Wilms

CASING SIZE	DEPTH SET	AMOUNT RECOVERED	SOIL OR RIPPED	BRIDGES OR PLUGS (SPUDS, STONE, CEMENT, ETC.)	DEPTH PLACED	NUMBER SACKS
8.5/8"	911'			Cemented	4030'	35
					1600'	35
					900'	20

Describe in detail how well was plugged. Circulated the hole with mud. Spotted 35 bags of reg. cement through the drill pipe at 4030', 35 bags at 1600' and 20 bags at 900'. Hole filled with mud, 8" casing to be cut off 3' below ground level and plated.

(USE REVERSE SIDE IF NEEDED)

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging? No If so, give detailsDid a Service Company pump mud, spot cement, or set bridge plugs? Yes If so, give name and address Allied Services, Inc. - Mt. Pleasant, MichiganWas the well plugged by a Company or Contractor other than Owner or Operator? No If so, give name and addressRepresentative of Owner, Operator, Company, or Contractor who witnessed plugging Chester Lowery

## CERTIFICATE:

I, R.O. Ankarberg of Michigan Consolidated Gas Company (Company), state that I am authorized by said Owner or Operator to make this report, and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge.

R.O. Ankarberg Reed City, Michigan Drilling Supt.  
(Signature) (Address) (Title)

## FINAL INSPECTIONS:

By Department Representative Russell Wilms

Date

May 23, 1968

DATE Jan. 29 1968

## FIELD ACTIVITY REPORT

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	Mich. Cons. Gas Co.	Yaddern #1	Evart	Osceola

Location note. Moving in rotary. Pits partly dug. I am not satisfied as to how this location is made but too late to correct problem. Pits are on low side of location and any excessive run off will cause a problem with pits overflowing. Location was moved 50' north to clear a steep hill. All drainage from location will run into Big Stone Lake, however, lakes are beyond 500' from location.

DATE Feb. 6 1968

## FIELD ACTIVITY REPORT

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	M. C. G. C.	Yaddern #1	Evart	Osceola

Comm. 2-1-68. Drift 592'. Drlg. 880'. No surface pipe set yet, still looking for a place to set surface pipe so a pressure test can be made on cement job.

DATE Feb. 12 1968

## FIELD ACTIVITY REPORT

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	M.C.G.C.	Yaddern #1	Evart	Osceola

Blowout preventers set and tested. Run in drill pipe and commenced drilling ahead. Found 500' of cement inside of 8". 3" set at 915 (500 cement + 20 sax in top of cellar).

DATE Feb. 14 1968

## FIELD ACTIVITY REPORT

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	M.C.G.C.	Yaddern #1	Evart	Osceola

Trip log 3366; Br. ls. 1440; Stray 1548'. PTD 1556'. Running a D.S.T. 1524-1556'. Rec. gas to surface 3 mins., gauged 477,000 cu. ft. Have tool shut in now for F.C.I.P.

DATE Feb. 15 1968

## FIELD ACTIVITY REPORT

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	M.C.G.C.	Yaddern #1	Evart	Osceola

Stray 1548'. DST 1524-1556'. Rec. gas to surface in 3 mins., gauged 350,000 on first flow, increased to 500,000 on second flow. Flow through 5/8" choke. Also recovered 100' of drill fluid in drill pipe. IHMP 759'; ICIP 578'; IFP 66 to 94'; FFP 94 to 96'; FCIP 578'; PHMP 759'. Drilling ahead to Reed City. Drlg. now at 1800'.

CONS 7231

INSPECTOR Wiles

The above information is complete and correct.

Date 3/19/68

R.D. ANKRIUS  
Title Drilling Supt.CONS. 7231  
REV. 9/64

GIVE COMPLETE FORMATION RECORD ON REVERSE SIDE

(Submit in Duplicate)

MAR 8 1968

## FIELD ACTIVITY REPORT

DATE Feb. 19 19 68 FIELD NAME OR TYPE WELL Drlg.-Wildcat  
 PERMIT NO. OPERATOR LEASE OR WELL NAME & NO. TOWNSHIP COUNTY  
 27159 Mich. Cons. Gas Co. Maddern #1 Ewart Osceola

Drlg. 3112'. Still in Antrim.

FEB 23 1968

## FIELD ACTIVITY REPORT

DATE Feb. 21 19 68 FIELD NAME OR TYPE WELL Drlg.-Wildcat  
 PERMIT NO. OPERATOR LEASE OR WELL NAME & NO. TOWNSHIP COUNTY  
 27159 Mich. Cons. Gas Co. Maddern #1 Ewart Osceola

Drlg. 3730'. 3470 DP = 3421 SIM.

FEB 26 1968

## FIELD ACTIVITY REPORT

DATE Feb. 22 19 68 FIELD NAME OR TYPE WELL Drlg.-Wildcat  
 PERMIT NO. OPERATOR LEASE OR WELL NAME & NO. TOWNSHIP COUNTY  
 27159 Mich. Cons. Gas Co. Maddern #1 Ewart Osceola

Trv. ls. 2333'; Bell 3850; Dd. 2891' Drlg. 2910; To drill ahead to Reed City & test. If no oil production is encountered will plug well to surface. Not to save gas encountered in stry.

FEB 27 1968

## FIELD ACTIVITY REPORT

DATE Feb. 23 19 68 FIELD NAME OR TYPE WELL Drlg.-Wildcat  
 PERMIT NO. OPERATOR LEASE OR WELL NAME & NO. TOWNSHIP COUNTY  
 27159 Mich. Cons. Gas Co. Maddern #1 Ewart Osceola

Trip: gy. 1266; Fr. ls. 1436; Stray 1942; Ant. 1040; Trv. fm. 3256; Trv. ls. 3304; Bell 3824; Dd. 2890; Anhyd. 3950(1); Reed City 3988(1). TD 4030'. 4030 DP = 4025 SJ. D & A. Completed 2-22-68. To plug 2-23-68 by running drill pipe to T.D. & spot 35 sax of cement on bottom. Pull drill pipe to 1600' and spot 35 sax of cement thru Stray. Pull drill pipe to base of 8-5/8" surface pipe and spot 20 sax of cement. 8-5/8" to be abandoned with the well. Cut off 3' below ground level & cap with 5 sax cement, however, while running in drill pipe hole caved in freezing drill pipe. Pipe stuck at 1865, cannot pull. Broke circulation OK & are now mixing good mud to attempt to free pipe & continue plugging well. Completed well using water for drilling fluid.

CONS 7231

INSPECTOR Willes

Rotary tools from 0 feet to 1030 feet. Cable tools from feet to feet.

Natural initial production first 24 hours. Bbls. After acid or shot. Bbls.

If gas well, cu ft. per 24 hours. Back pressure, lbs. per sq. in.

The above information is complete and correct.

Signed, R.O. Ankarberg  
 Title, Drilling Supt.

Date 2/19/68

CONS. 7210  
 REV. 2/64

GIVE COMPLETE FORMATION RECORD ON REVERSE SIDE

(Subst. to Duplicate)



FEB 27 1968

## FIELD ACTIVITY REPORT

DATE Feb. 27 1968

FIELD NAME OR TYPE WELL

Drig.-Wildcat

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	Mich. Cons. Gas Co.	Maddern #1	Evart	Osceola

Trip, gyp. 1766; Br. ls. 1436; Stray 1548; Ant. 3040; Trv. fm. 3256; Trv. ls. 3304; Boll. 3934; Dt. 3950; anhyd. 3950(?); Reed City 3948(?). TD 4030'. 4030 DP = 4025 SJ). D & A. Completed 2-22-68. To plug 2-23-68 by running drill pipe to T.D. & spot 35 sax of cement on bottom. Pull drill pipe to 1600' and spot 35 sax of cement thru Stray. Pull drill pipe to base of 8-5/8" surface pipe and spot 20 sax of cement. 8-5/8" to be abandoned with the well. Cut off 3' below ground level & cap with 5 sax cement, however, while running in drill pipe hole caved in freezing drill pipe. Pipe stuck at 1865, cannot pull. Broke circulation OK & are now mixing good mud to a tempt. to free pipe & continue plugging well. Completed well using water for drilling fluid.

INSPECTOR

Wiles

CONS 7231 -

## FIELD ACTIVITY REPORT

DATE Feb. 27 1968

FIELD NAME OR TYPE WELL

Drig.-Wildcat

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	M.C.G.C.	Maddern #1 - Continued	Evart	Osceola

Mud vis. 32, wt. 8.6, wr. loss 2.5 cc. Circulated mud in hole. 2-26-68 Backed off drill pipe & collars at 1500'. Ran in Halliburton packer & jars to 1500. Cut too much mud cake. Pulled packer & jars & reconditioned hole with 7-7/8" bit with jets out. Reran packer with jars & connected on to drill collars. Pipe dropped down hole 4'. Top of pipe 1586'. Removed packer & reran again & recovered all drill collars. Laid down all drill collars and reran drill pipe to TD. Used a 7-1/4" bit with water courses out. Spotted 35 sacks of cement on bottom. Pulled drill pipe to 1600' & spotted 35 sax of cement thru stray, pulled drill pipe to base of 8 5/8" surface pipe (Cont'd)

INSPECTOR

Wiles

CONS 7231

FIELD NAME OR TYPE WELL

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	M.C.G.C.	Maddern #1	Evart	Osceola

Well D & A on 3-22-68. TD 4030'. When running in drill pipe to plug pipe stuck at 1865', could not move. (Had 20 drill collars in hole). Completed well with salt water. Broke circulation OK so mixed mud using 32 sax of salt gel + 2 sax of mylogel. Mud did not free pipe. Spotted 110 gals. of B 19 chemical + 20 gal. of oil. Pipe still froze. Continued spotting oil around drill collars but pipe still froze. On 2-24-68 continued spotting oil around drill collars and working pipe, pipe began to work free but would not travel. 2/25/68 Pipe still stuck. Had McCullough Tool Co. check for free point, found drill pipe free to 931'. Cleaned mud pits again & mixed a new pit of mud using 40 sax mylogel + other chemicals. Cont'd.

INSPECTOR

Wiles

CONS 7231

## FIELD ACTIVITY REPORT

DATE Feb. 27 1968

FIELD NAME OR TYPE WELL

Drig.-Wildcat

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	M.C.G.C.	Maddern #1 - Continued	Evart	Osceola

and spotted 20 sax. 8" abandoned with the well. Cut off 3' below ground level and capped with 5 sax cement. To move rotary to Reed City for next well.

NOTE: Accompanied Frank Vining to Big Rapids checking on a complaint concerning a brine loss at a brine well operated by Macosta County southeast of Big Rapids. Brine loss repaired and brine tanks in good order. No problem when checking.

## FIELD ACTIVITY REPORT

DATE May 22 1968

FIELD NAME OR TYPE WELL

MAY 24 1968

Plugged-Wildcat

PERMIT NO.	OPERATOR	LEASE OR WELL NAME & NO.	TOWNSHIP	COUNTY
27159	Mich. Cons. Gas	Maddern #1	Evart	Osceola

Plugged to surface. Collar & pits filled and leveled. Some debris on location, however will remove soon. OK to approve.

1219  
5/67

STATE OF MICHIGAN  
DEPARTMENT OF CONSERVATION  
SUPERVISION OF WELLS

B 27 100

PERMIT TO PLUG AND ABANDON

FIELD NAME

Wildont

277.59

WELL OPERATOR

Michigan Consolidated Gas Company

WELL NO.

1

Maddara

SECTION

TOWNSHIP

COUNTY

5 1/2 IN. DIA.

30

17N

8W

East

Onondaga

TYPE OF WELL (Oil, Gas, Water, etc.)

DATE COMPLETED

Feb. 22

1968

Dry Hole

LAST PRODUCTION (Amount, Date, etc.)

OIL

WATER

GAS

PLUGGING TO BE DONE BY

DATE PLUGGING WILL START

Feb. 23

1968

Company Tools & Allied Services

PLUGGING FIRM'S REGISTERED ADDRESS (Not owner of a registered firm or address)

DATE

Feb. 22

1968

Jerry Dyer

PLUGGING FIRM'S NAME

Michigan Consolidated Gas Company

East City, Michigan 49677

CASING AND PERFORATION RECORD

SIZE OF CASING	DEPTH SET	LOGS (Feet)	PERFORATION
8 5/8"	915	500 + 20	

FORMATION TOPS AND OTHER DATA (Formation & depth, Oil, Gas & Water Shows, etc.)

Dev.	1157 RF	Antrim	3040	TD	4030
	1159 RB	Trv. fm.	3256		
	1144.5 Or.	Trv. ls.	3304		
Draft	592	Bell	3834		
Trip exp	1316	Dundee	3890		
Br. ls.	1436	Anhyd.	3950		
Sandy	1548	Rd. Cy.	3998		

PLUGGING REQUIREMENTS:

Run drill pipe to total depth and spot 35 sacks of cement on bottom. Pull drill pipe to 1600' and spot 35 sacks of cement through string. Pull drill pipe to base of the 8 5/8" surface pipe and spot 20 sacks of cement. Pull remainder of drill pipe.

8 5/8" surface pipe to be abandoned with the well. Cut pipe off 3' below ground level and cap with 5 sacks of cement.

Plugging requirements outlined above are to be executed in accordance with the provisions of Act 61, P.A. 1939, and/or Act 326, P.A. 1937, and the rules and regulations issued and adopted thereunder. NOTE: THE PLUGGING OF THIS WELL CANNOT BE APPROVED UNTIL THE PLUGGING IS COMPLETED, CLEAN, RAT HOLE AND PITS FILLED AND THE LOCATION HAS BEEN CLEANED AND LEVELLED.

PERMIT COMPLETION BY

FIELD OFFICE

Initials

DATE

Feb. 26

1968

ALL PLUGGING PERMITS, WITH CONS. 113, to be filed in triplicate within 12 days after completion.

BOX 30028

BOX 30028

MAR 11 1971

95.2  
3/64

MICHIGAN DEPARTMENT OF CONSERVATION  
GEOLOGICAL SURVEY DIVISION

PLEASE FILE IN  
TRIPLICATE

REQUEST FOR TRANSFER OF PERMIT

Reed City, Michigan, Feb. 23, 1971

Supervisor of Wells  
Lansing, Michigan

Please transfer Permit No. 27159 issued to Michigan Consolidated Gas Co.  
for H. Maddern No. 1 located in the SE 1/4 NW 1/4 SE 1/4 section  
30, T. 17, R. 8W, Everh Township, Oscoda County,  
to Madlou, Inc. All operating interests have been disposed of by us (us) and  
are being assumed by this proposed operator.

OPERATOR Michigan Consolidated Gas Co.

By *J. Wary*

NOTE: NO PERMIT SHALL BE TRANSFERRED WHEN AN OWNER OR HIS AUTHORIZED REPRESENTATIVE IS NOT COMPLYING OR HAS NOT COMPLIED WITH THE PROVISIONS OF ACT 61, PUBLIC ACTS OF MICHIGAN, 1936, AS AMENDED, OR ACT 326, PUBLIC ACTS OF MICHIGAN, 1937, AS AMENDED, OR THE REGULATIONS OR ORDERS ISSUED BY THE SUPERVISOR OF WELLS OR HIS AUTHORIZED REPRESENTATIVE.

Reed City, Michigan, Feb 23, 1971

Supervisor of Wells  
Lansing, Michigan

Madlou, Inc.

has acquired the well drilled under Permit No. 27159

ACQUIRING OPERATOR

and is assuming full responsibility for its operation and abandonment in conformity with the law, regulations and orders issued by the Supervisor of Wells. A surety bond is now on file covering these operations.

ACQUIRING OPERATOR Madlou, Inc. PHONE 832-5164

ADDRESS Box 176, Reed City, Mich. STATE

BY *C. B. H. Bishop*

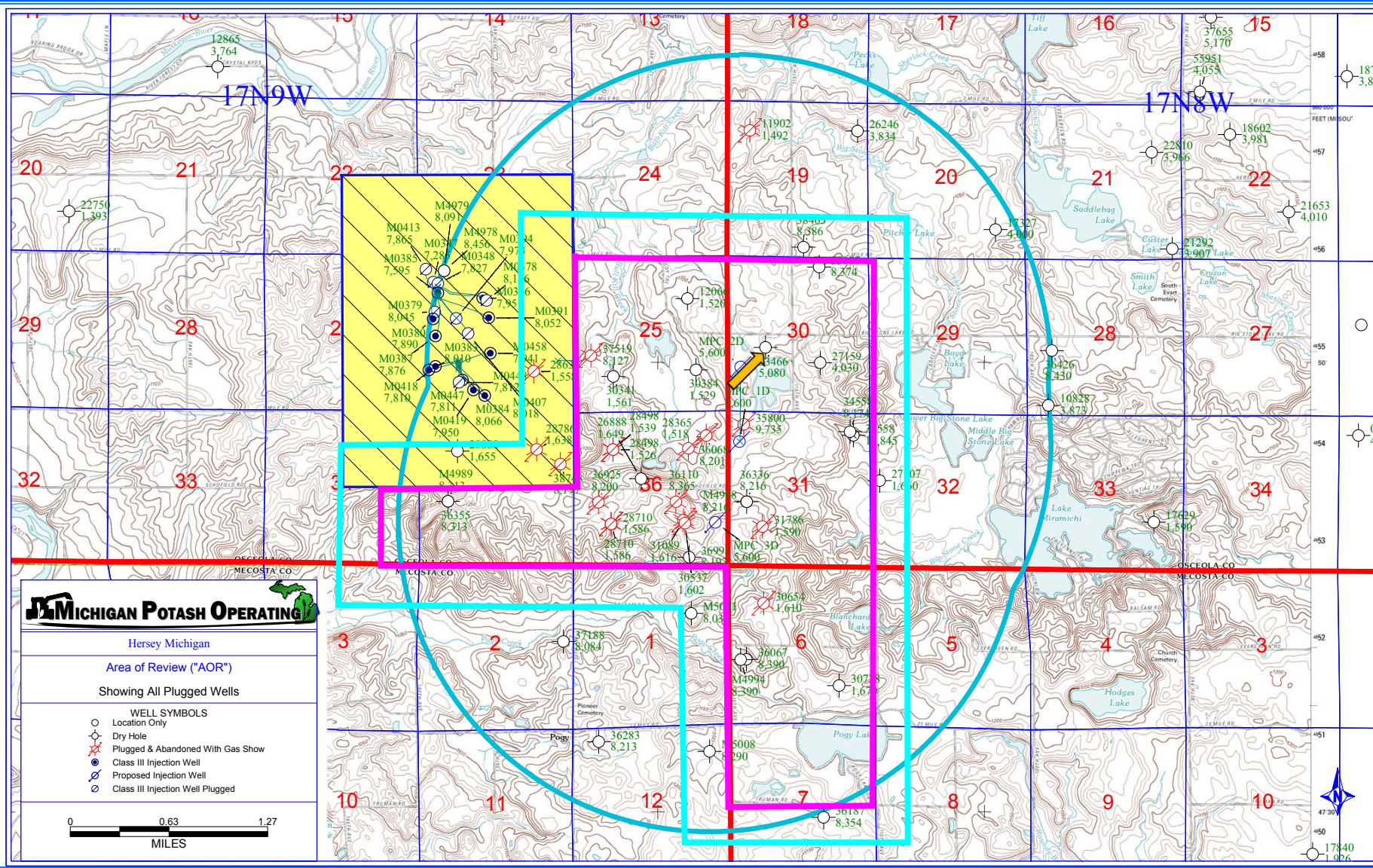
TYPE OF WELL LUGGED DRY HOLE

MAR 12 1971

DATE TRANSFER APPROVED

TRANSFER APPROVED BY *V. J. August*

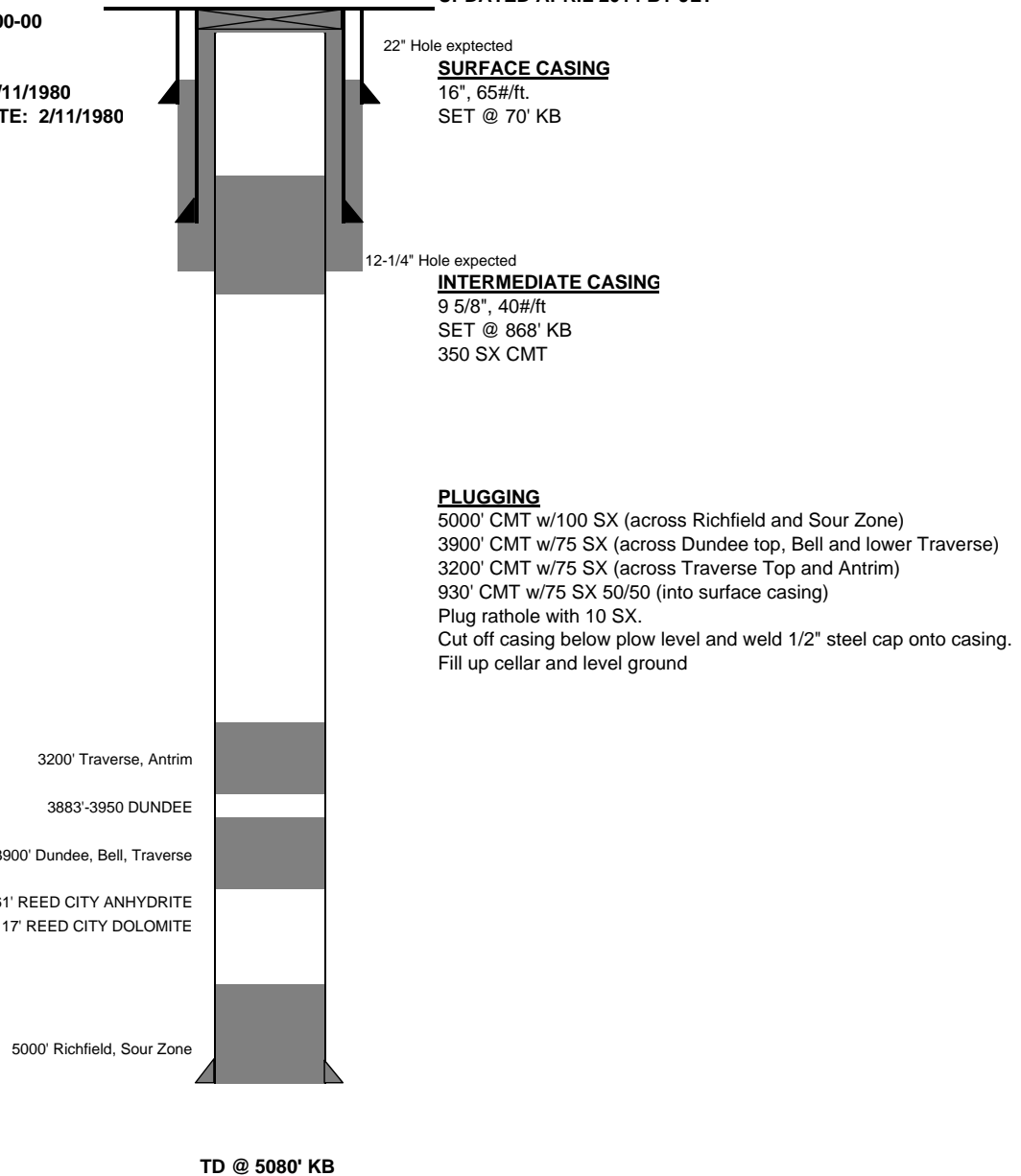




**MANEY 1-30**  
NW NE SW Sec 30 T17N R8W  
OSCEOLA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

PERMIT No. 33466  
API No. 21-133-33466-00-00  
GL @ 1130.2'  
KB @ 1142.4'  
WELL COMPLETION DATE: 2/11/1980  
PLUGGING COMPLETION DATE: 2/11/1980

UPDATED APRIL 2014 BY JLT



**MANEY 1-30 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
1/26/1980	SPUD.
2/9/1980	DRILLING COMPLETED.  16" SET AT 70' 9 5/8" SET AT 868'; 350 SX CMT
2/11/1980	PLUGGING START DATE 5000' CMT w/100 SX (across Richfield and Sour Zone) 3900' CMT w/75 SX (across Dundee top, Bell and lower Traverse) 3200' CMT w/75 SX (across Traverse Top and Antrim) 930' CMT w/75 SX 50/50 (into surface casing) Plug rathole with 10 SX. Cut off casing below plow level and weld 1/2" steel cap onto casing. Fill up cellar and level ground
2/11/1980	PLUGGING COMPLETED



# APPLICATION FOR PERMIT TO DRILL A WELL FOR OIL, GAS, BRINE DISPOSAL, HYDROCARBON STORAGE OR FOR SECONDARY RECOVERY

Under Authority of Act 61, P.A. of 1939, As Amended.

MAIL TO:  
STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
Box 30028, Lansing, Michigan 48909

R 7207  
Rev. 12/77

See Reverse Side Before Filling Out This Application

<p>LOCATE WELL AND OUTLINE UNIT ON SECTION PLAT - 640 ACRES</p>	1. Application to drill a well for: <b>Oil</b>	2. Date <b>12/5/79</b>	3. Fee enclosed <b>\$ 100.00</b>
	4. Applicant's name(s) as it is on the surety bond(s) <b>Dart Oil &amp; Gas Corporation</b>		
	5. Permanent address <b>600 Dart Road, Mason, Michigan 48854</b>		6. Phone <b>517-676-2900</b>
	7. Lease name (owner of mineral rights) <b>Norman Maney</b>		8. Well No. <b>1-30</b>
	9. Surface owner <b>same</b>		
	10. Address <b>Rt. #1, Evart, Michigan 49631</b>		11. Phone
	12. Drilling contractor <b>Provins Drilling Co.</b>		
	13. Address <b>600 West Pickard, Mt. Pleasant, Michigan 48858</b>		14. Phone
	15. Surface location <b>NW 1/4 of NE 1/4 of SW 1/4 Section 30 T 17N R 8W</b>		
	16. Township <b>Evart</b>		17. County <b>Osceola</b>
18. Locate well in two directions from nearest lines of quarter section and unit lines. (Surface location)			
<b>460</b> Ft. From <b>north</b> Line of quarter section (north-south)		<b>860</b> Ft. From <b>east</b> Line of quarter section (east-west)	
<b>460</b> Ft. From <b>north</b> Unit line (north-south)		<b>460</b> Ft. From <b>west</b> Unit line (east-west)	
19. Kind of tools to be used (Cable, rotary, combination) <b>Rotary</b>		20. Formation in which well is to be completed <b>Amherstburg</b>	
		21. Intended depth of well <b>5250'</b>	
22. Program of casing, sealing, cementing and completing well (SEE REVERSE SIDE)			

Drill 12 1/4" hole and set approximately 760' 8 5/8" 24# K55 surface casing, 2  
Circulate cement to surface.  
Drill 7 7/8" hole to TD.  
Set 5 1/2" 15.5# K55 production casing if productive AND ADEQUATELY CEMENT.  
~~B.O.P. series 900-3000# test Cameron type double ram.~~  
~~series 900-3000# Regan tube type.~~  
~~Completion unit will be used to complete well if productive.~~

CASING IS NOT TO BE STRIPPED FROM THE HOLE AND NO CHANGE IS TO BE MADE IN THE PROGRAM OUTLINED  
ABOVE WITHOUT APPROVAL OF THE SUPERVISOR OF WELLS OR HIS AUTHORIZED REPRESENTATIVE

APPLICANT AGREES TO COMPLY WITH THE PROVISIONS OF ACT 61, PUBLIC ACTS OF 1939, AS AMENDED, AND RULES PERTAINING TO THE LOCATING,  
DRILLING, CASING, SEALING, COMPLETING, PRODUCING, AND PLUGGING OF WELLS. BEFORE COMMENCING DRILLING OPERATIONS, CONTACT THE  
NEAREST FIELD OFFICE. (See reverse side)

23. Send correspondence and permit to: <b>Dart Oil &amp; Gas Corporation Attn: W.H. Veatch</b>		24. Phone <b>517-676-2900</b>
25. Address <b>600 Dart Road, Mason, Michigan 48854</b>		
LEAVE BLANK		
Date Issued <b>1-9-80</b>	Permit No. <b>33,466</b>	26. Name of applicant's agent (Print) <b>W.H. Veatch</b>
		27. Signature of agent 

FOR CASHIER'S USE ONLY. DO NOT WRITE IN THIS SPACE

For Geological Survey Use Only

- |                     |                      |
|---------------------|----------------------|
| 1. White - Lansing  | 4. Goldenrod - Field |
| 2. Canary - Cashier | 5. Green - Applicant |
| 3. Blue - Field     |                      |

5028-10 10071 1000

## INSTRUCTIONS FOR PREPARING APPLICATION FOR PERMIT

1. Use form R-7207. (Five copies in set. Green will be returned when permit is issued.)
2. WELL LOCATION SURVEY. Use form R-7208. Submit five copies. (Surveyors plat may be substituted for form R-7208.) Submit supplemental information and maps if lakes, streams, swamps, buildings, roads, powerlines, etc., are within one quarter mile of location.
3. ENVIRONMENTAL IMPACT ASSESSMENT. Use form R-7616 or equivalent. Submit five copies. (See instructions and guidelines furnished with forms.)
4. WELL ELEVATION. Furnish with well location survey or submit certification that elevation will be run and submitted within fourteen days after drilling commences.
5. SURETY BOND. Proper bond coverage must be submitted with application or must have been filed previously. (See General Rules for details.)
6. PERMIT FEE. Must accompany application for permit. (See statute for applicable fee.) (Make check payable to STATE OF MICHIGAN.)
7. PROGRAM OF CASING, SEALING, CEMENTING AND COMPLETING WELL (SECTION 22). Include the different hole sizes and depths to be drilled; casing sizes, weights, grades and lengths; amount and type of cement and additives if used. Indicate the type, weight and viscosities of drilling fluids to be used. List blowout control equipment to be used; give size, type, pressure ratings and order of assembly. Indicate intended well logging and completion program, auxiliary equipment to be used (i.e. sour gas), if any, and general information and remarks not covered by the above.

### IF THIS APPLICATION IS FOR A HOLE TO BE DIRECTIONALLY DRILLED, SUBMIT THE FOLLOWING SUPPLEMENTAL INFORMATION:

(Five copies required.)

1. Give geographical description of intended bottom hole location.
2. Give correct footage measurements of intended bottom hole location from the NEAREST quarter section lines and from NEAREST unit lines.
3. Give RADIUS of intended bottom hole target area.
4. DIRECTIONAL DRILLING AND ENGINEERING PROGRAM. Include deviation kick-off points, degree of deviation intended, proposed depth and True Vertical Depth of the bottom hole. Specify the lateral distance and direction from the surface location to the proposed bottom hole location. Give name and address of the engineering company who will direct the deviation of the well bore and any general information and remarks not covered.

**NOTICE: When drilling commences, the proper area field office MUST be notified!**

#### FIELD OFFICES

##### Grayling

P.O. Box 507, 49738  
Phone (A/C 517)  
348-6371

##### East Lansing

8562 East Stoll Rd., 48823  
Phone (A/C 517)  
339-8638

##### Mt. Pleasant

204 Court St., 48858  
Phone (A/C 517)  
773-9965

##### Imlay City

P.O. Box 218, 48444  
Phone (A/C 313)  
724-2015

##### Plainwell

P.O. Box 355, 49080  
Phone (A/C 616) 685-6851

##### Cadillac

P.O. Box 629, 49601  
Phone (A/C 616) 775-9728

##### Gaylord

P.O. Box 576, 49735  
Phone (A/C 517) ~~732-1622~~  
732-3541

THE SUPERVISOR OF WELLS IS PROHIBITED BY LAW FROM ISSUING A DRILLING PERMIT TO ANY OWNER OR OPERATOR WHO IS IN VIOLATION OF ANY OF THE PROVISIONS OF ACT 61, P.A. 1939, AS AMENDED, OR ANY OF THE RULES OR ORDERS PROMULGATED THEREUNDER.

STATE OF MICHIGAN  
**DEPARTMENT OF NATURAL RESOURCES**      **Nº 5680**  
SUPERVISOR OF WELLS  
**PERMIT TO DRILL**      For Auditing Only  
(POST WHITE COPY OF PERMIT AT WELL LOCATION)

Permit No. 33466      Issue Date January 9, 1980      Termination Date January 9, 1981

Permission is hereby granted to Dart Oil & Gas Corporation  
Owner  
600 Dart Road, Mason, MI. 48854  
Address

Lease Name Norman Maney      Well Number 1-30

Location NW¼ NE¼ SW¼ Section 30, T.17N., R.8W., Ewart Twp., Osceola County

Footages 460' from north and 860' from east line of quarter section  
460' from north and 460' from west unit line

Type of Well Oil      Kind of Tools Rotary      Objective Formation Amherstburg      Intended Depth 5250'

This permit is issued subject to the provisions of Act 61, P.A. 1939, as amended, and rules, requirements, or orders issued by the Supervisor of Wells and Department of Natural Resources.

SUPERVISOR OF WELLS  
By *Daniel T. Bortan*

**CASING AND SEALING REQUIREMENTS**

Drill 12 ¼" hole and set approximately 760' 8 5/8" 24# K55 surface casing, circulate cement to surface.

Drill 7 7/8" hole to total depth.

Set 5 1/2" 15.5# K55 production casing if productive and adequately cement.

**NOTICE**

IT IS FURTHER MADE A REQUIREMENT OF THIS PERMIT that the applicant give notice to the Public Utilities in accordance with Act 53, P.A. 1974 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

DRILLING PERMIT ISSUED on the basis of the drilling, casing and sealing program as outlined on the application for permit and subject to requirements as set forth above. No change or alteration is to be made without the permission and approval of the Supervisor of Wells or his authorized representative.

DRILLING OPERATIONS ARE NOT TO BE COMMENCED until all the well location requirements have been completed and the permit has been posted in a conspicuous place at the well site. The nearest field office of the Department of Natural Resources must be notified prior to the commencement of drilling, deepening, reworking, and plugging.

**DEPARTMENT FIELD OFFICES**

Region II, Roscommon	Phone 517-275-5151	Region III, Lansing	517-322-1300
Cadillac	Phone 616-775-9728	E. Lansing	517-339-8638
Gaylord	Phone 517-732-3541	Imlay City	313-724-2015
Mt. Pleasant	Phone 517-773-9965	Plainwell	616-685-6851
		Grand Rapids	616-456-5071

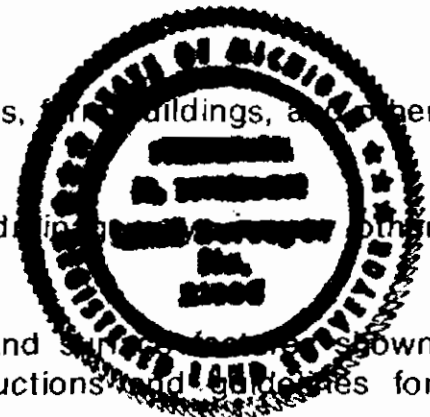
STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGY DIVISION

## SURVEY RECORD OF WELL LOCATION

(Submit in quadruplicate with Application for Permit to Drill a Well for Oil or Gas,  
Brine Disposal, Secondary Recovery, or Gas or L.P.G. Storage)

79446

LESSEE (OWNER OF LEASE RIGHTS) <b>DART OIL AND GAS CORPORATION</b>			
LESSOR (OWNER OF MINERAL RIGHTS) <b>Norman Maney</b>			WELL NO. <b>1-30</b>
LOCATION <div style="display: flex; justify-content: space-between; font-weight: bold;"> <span>NW ¼ OF</span> <span>NE ¼ OF</span> <span>SW ¼ SECTION 30</span> <span>T. 17N</span> <span>R. 8W</span> </div>			
TOWNSHIP <b>Evart</b>		COUNTY <b>Osceola</b>	
PLAT BELOW REPRESENTS ONE FULL SECTION (1 Mile Square)		<div style="text-align: center;">   <b>N</b> </div> <ol style="list-style-type: none"> <li>1. Outline drilling unit and spot well location on plat at left. Where drilling unit crosses section lines, divide the plat into an east half and a west half <b>OR</b> a north half and a south half (which ever applies). Outline the unit and locate the well in two directions from <b>NEAREST</b> quarter section and unit lines.</li> <li>2. Location of well in two directions from <b>NEAREST</b> quarter section and unit lines is:           <div style="margin-top: 10px;"> <div style="display: flex; justify-content: space-between;"> <span>460</span> <span>ft. from</span> <span>North</span> <span>line of Quarter Section</span> </div> <div style="text-align: center; font-size: small;">(north-south)</div> <div style="display: flex; justify-content: space-between;"> <span>860</span> <span>ft. from</span> <span>East</span> <span>line of Quarter Section</span> </div> <div style="text-align: center; font-size: small;">(east-west)</div> <div style="display: flex; justify-content: space-between;"> <span>460</span> <span>ft. from</span> <span>North</span> <span>line of unit</span> </div> <div style="text-align: center; font-size: small;">(north-south)</div> <div style="display: flex; justify-content: space-between;"> <span>460</span> <span>ft. from</span> <span>West</span> <span>line of unit</span> </div> <div style="text-align: center; font-size: small;">(east-west)</div> </div> </li> <li>3. Describe wellsite marker. Show or describe access route if it is not readily accessible.              Wellsite is marked with a wood stake.              Access is from the North off Big Stone Lake Road.           </li> </ol>	
(Scale of Plat — 1 inch equals 1320 ft.)			
4. ON SEPARATE PLAT OR PLOT PLAN:			
A. Locate, identify, and show distances to all roads, power lines, residences, buildings, and other structures within 300 feet of the stake;			
B. Locate, identify, and show distances to all lakes, streams, swamps, ditches, and other surface water features within 1320 feet of the stake.			
5. In an ENVIRONMENTAL IMPACT ASSESSMENT describe all structures and surface features shown detailing plans for hazards prevention and erosion control (See instructions and guidelines for preparation of an environmental impact assessment).			
NAME OF INDIVIDUAL WHO SURVEYED WELL SITE <b>Frederick H. Thomson, RLS #21996</b>		DATE <b>12-14-79</b>	
ADDRESS <b>J. L. WILCOX &amp; ASSOCIATES, INC.</b>		TITLE <b>Surveyor</b>	
<b>I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF</b>			
SIGNATURE (LESSEE OR AUTHORIZED REPRESENTATIVE) 		ADDRESS (IF DIFFERENT THAN LESSEE) <b>7230 North US-131 Manton, Michigan 49663</b>	
DATE (MONTH, DAY, YEAR) <b>12-14-79</b>			



WEST LINE SEC. 30

N 1/4 LINE

N

POND



POWER LINE

1" = 660'

E 1/4 LINE

BIG STONE LAKE ROAD

POND

120TH

EARTHEN DAM

115TH

MAN MADE LAKE

SOUTH LINE SEC. 30

1 MILE ROAD

SUPPLEMENTAL PLAT: MANEY 1-30  
SECTION 30, T17N, R8W,  
EVART TWP., OSCEOLA COUNTY  
MICHIGAN

CLIENT: DART OIL & GAS

DATE  
12-13-79

DRN. R.M.

CHD ALF

SCALE

V. 1" = 660'

J.L. WILCOX & ASSOCIATES, INC.  
Engineers and Surveyors  
7230 N. U.S. - 131 • Manton, Michigan 49663

NOTES

F.B.  
PG

SHEET

1 OF 1

JOB NO.

79446



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

FEB 28 1980

PERMIT NUMBER 33466

DEEPENING PERMIT NUMBER

FINAL

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Dart Oil & Gas Corporation 600 Dart Road Mason, Michigan 48854				NAME & ADDRESS OF DRILLING CONTRACTOR(S) Bigard Drilling Company 1315 N. Mission Road, P.O. Box 509 Mt. Pleasant, Michigan 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Maney #1-30						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NW NE SW		SECTION 30		TOWNSHIP 17N		RANGE 8W	
FOOTAGES (North/South) 460 Ft. from North Line and 860 Ft. from East Line of quarter section						TOWNSHIP NAME Evart	
SUBSURFACE LOCATION		SECTION		TOWNSHIP		RANGE	
FOOTAGES (North/South) Ft. from Line and Ft. from Line of quarter section						COUNTY NAME Osceola	
DRILLING BEGUN 1/26/80		TOTAL DEPTH OF WELL Driller 5080 Log 5080		TYPE WELL Dry Hole		ELEVATIONS	
DRILLING COMPLETED 2/9/80		FORMATION AT T.D. Amherstburg		FT. DRLD. - ROTARY TOOLS From 0 To 5080		K.B. 1142.4	
WELL COMPLETED 2/11/80		PRODUCING FORMATION(S) None		FT. DRLD. - CABLE TOOLS From To		R.T. Grd. 1130.2	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
							YES	NO
9 5/8	868	350 SXS						

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Sour Zone	Gas	4646-53		X			X	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	GR-Cal/ONL-FDC	100-5078							
Birdwell		DLL - Micro	3000-5076							
		BHC Sonic	3000-5076							

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 2/12/80	NAME AND TITLE (PRINT) Richard Hinkley, Geologist	SIGNATURE <i>Richard Hinkley</i>
-----------------	--	-------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

# FORMATION RECORD

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

ELEVATION USED: <b>1142.4</b>	GEOLOGIST NAME: <b>Richard Hinkley</b>	TOPS TAKEN FROM: <input type="checkbox"/> DRILLERS LOG <input type="checkbox"/> SAMPLE LOG <input checked="" type="checkbox"/> ELECTRIC LOG
----------------------------------	---	--

FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)	FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)
NOTE: IF WELL DIRECTIONALLY DRILLED, ADD TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE.					
0	737	Drift			
737	874	Sand			
874	1360	Sand & Shale			
1360	1400	Triple Gyp.			
1400	1548	Shale & Sand stringers			
1548	1601	Michigan Stray Sand			
1601	1736	Shale & Sand			
1736	2592	Coldwater Shale			
2592	2712	Sudbury Shale			
2712	3094	Bedford Shale			
3094	3247	Antrim Shale			
3247	3299	Traverse Fm.			
3299	3827	Traverse Lime (L.S. vf xln, Dense, tight, no fluorescence.)			
3827	3883	Bell Shale			
3883	3950	Dundee Lm.			
3950	3961	Reed City Anhydrite			
3961	4117	Reed City Dolomite (Dol, vf xln, sucrosic tex, some Intergranular porosity, Trace Dull Fluorescence.)			
4117	4718	Detroit River (Salt, anhydrite, & dolomite. Gas shows in sour zone, no Fluorescence.)			
4718	4780	Massive Anhydrite			
4780	5039	Richfield (Interbedded anhy & dolomite, vuggy and intergranular porosity at base of formation, no hydrocarbon shows.)			
5039	5080	Black Lime (L.S. F.xln, V. Arg, fair porosity, no hydrocarbon shows.)			
	5080	T.D.			
IF WELL WAS CORED, ATTACH CORE DESCRIPTION					
DRILL STEM TEST DATA					

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

FEB 28 1980

AUG 26 1980 LANSING HAS COPY MAR 03 1980

AK

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER	33466
FIELD NAME	Hersey/Evart

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER Dart Oil & Gas Corp., 600 Dart Road, Mason, Michigan 48854		
COMPLETE LEASE OR FARM NAME(S) Norman Maney		WELL NUMBER 1-30
WELL LOCATION NW ¼ NE ¼ SW ¼ SEC. 30 T. 17N R. 8W	TOWNSHIP Evart	COUNTY Osceola
TYPE OF WELL (Oil, Gas, Dry Hole, etc.) Dry Hole	TOTAL DEPTH 5080	FORMATION Amherstburg
DATE PLUGGING STARTED 2/11/80	DATE PLUGGING COMPLETED 2/11/80	DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING Michael Moss

CASING RECORD			
SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
16"	70'	none	
9 5/8"	868'	none	

BRIDGES OR PLUGS		
TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	5000'	100 sx
Cement	3900'	75 sx
Cement	3200'	75 sx
Cement	930'	75 sx
Cement	surface	10 sx
	(rat hole)	

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	If yes, give details: All casing left in hole.
Did a Service Company pump mud, spot cement, or set bridge plugs?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	If yes, give name and address: Dowell, Box 159, Mt. Pleasant, Michigan 48858
Was the well plugged by a Company or Contractor other than Owner or Operator?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	If yes, give name and address: Bigard, 1315 N. Mission Road, P.O. Box 509, Mt. Pleasant, Mich. 48858
Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:		Jud Howdyshell

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED 100 sx spotted at 500' (across Richfield and Sour Zone), 75 sx spotted at 3900' (across Dundee top, Bell and lower Traverse), 75 sx spotted at 3200' (across Traverse Top and Antrim), 75 sx spotted at 930' (into surface casing). Plug rathole with 10 sx. Cut off casing below plow level and weld ½" steel cap onto casing. Fill up cellar and level ground.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION		
"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."		
NAME AND TITLE (Typed or Printed) Ward Kelner, Evaluation Engineer	DATE (Month, Day, Year) 2/13/80	COMPANY NAME AND ADDRESS Dart Oil & Gas Corporation 600 Dart Road Mason, Michigan 48854
SIGNATURE <i>Ward Kelner</i>		

# OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

Supplemental Plugging Data and Site Conditions:

8/22/00 - SITE "CLEAN, LEVEL, AND OK FOR APPROVAL"

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

SIGNATURE

DIVISION

DATE

Michael J. Ross

GEOLOGICAL SURVEY

8/22/00

FEB 19 1980

## STATE OF MICHIGAN

DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

## PERMIT TO PLUG AND ABANDON

## DNR DISTRIBUTION

Permittee — Orig & 1 copy  
Division Office — 2 copies  
Field Office — File copy  
Others — On request

PERMIT NUMBER

33466

FIELD NAME

## NAME AND ADDRESS OF PERMITTEE

Dart Oil &amp; Gas

## LEASE NAME AND WELL NO

Maney 1-30

## LOCATION (1/4, 1/2, 1/4 or other)

NW NE SW,

## SECTION

30

T 17N R 8W

Evart

## TOWNSHIP

Osceola

## COUNTY

## TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry hole

## DATE COMPLETED

2/10/80

## DATE PLUGGING WILL START

2/11/80

## PLUGGING PERMIT REQUESTED BY &amp; DATE

T. Baker 2/9/80

## LAST PRODUCTION

BOPD

BWPD

MCFGPD

DATE

## PLUGGING TO BE DONE BY

Bigard #3

## PERMIT MAILED TO

Dart Oil &amp; Gas

600 Dart Rd.

Box 151A

Mason, MI 48954

## COPIES MAILED TO

## CASING AND CEMENTING RECORD

HOLE DIA	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT TOP.	PERFORATIONS
	16"	70			
	95/8"	868	350	surf.	

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

## E LOG TOPS:

STRAY SAND 1548

COLDW SH 1822

ANT 3093

TF 3247

TL 3299

BELL 3827

DD 3883

RCA 3950

RCD 3961

DR 4117

1ST DRS 4181

MASSIVE 4718

RICH 4780

BL LM 5039

TD 5080

PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

Spot 100 sx cmt. at 5000'.

Spot 75 sx cmt at 3900

Spot 75 sx cmt at 3200'

Spot 75 sx at 920'.

Cut csg off 3' below grd &amp;

cap w/cmt &amp; steel plate.

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 480.701 to 480.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

Michael J. Brown

OFFICE

Cadillac, D#6

DATE

2/12/80

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion

R-7229  
Rev. 11/77



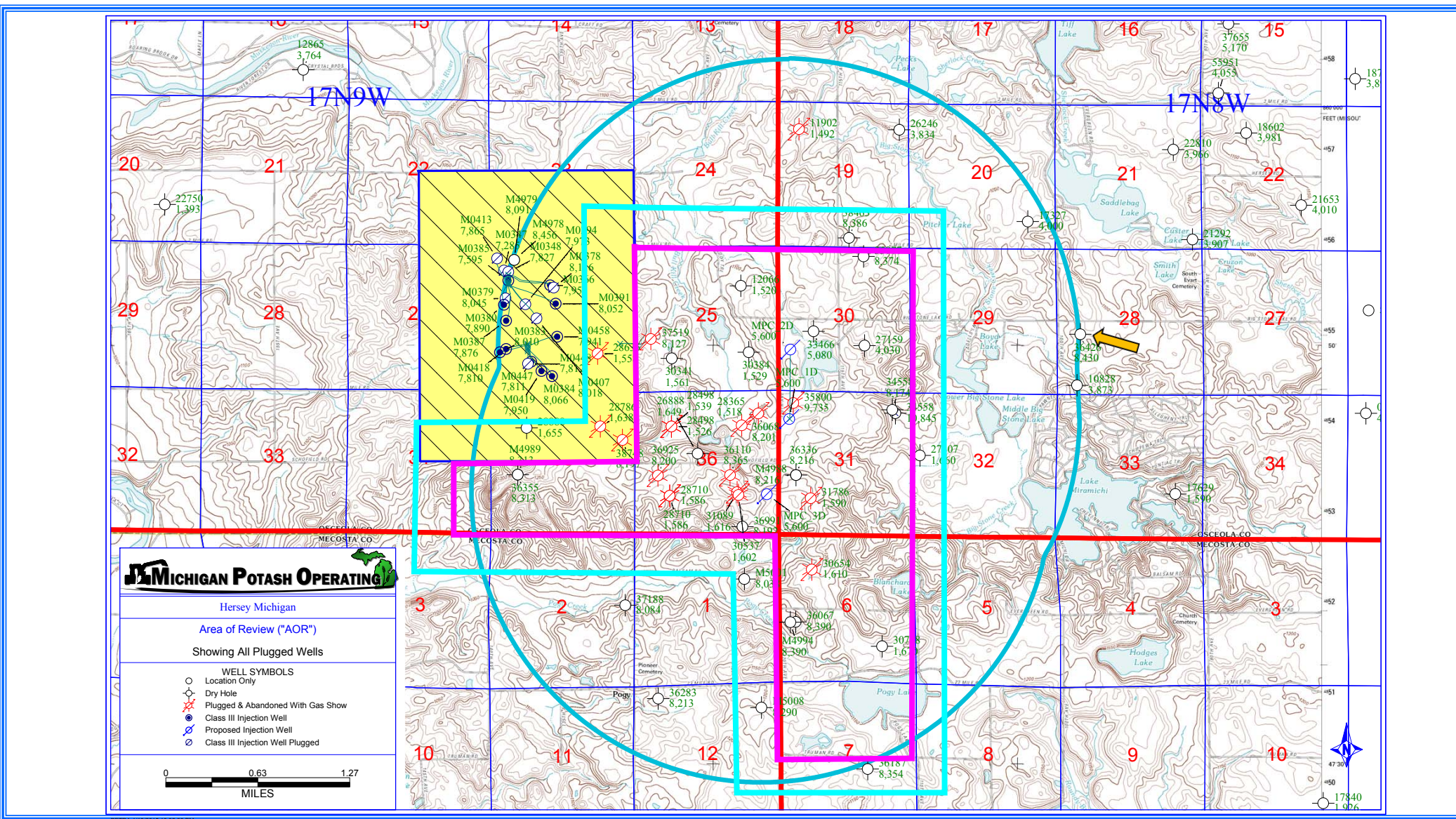


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**MCCLAIN 1-28**  
**NE NW SW Sec 28 T17N R8W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

**UPDATED APRIL 2014 BY JLT**

24" CONDUCTOR DRIVEN TO 60'

15" Hole expected

**SURFACE CASING**

13 3/8"

SET @ 873' KB

CMT w/ 900 SX TO SURFACE

13-1/4" Hole expected

**INTERMEDIATE CASING**

9 5/8"

SET @ 5472' KB

CMT w/ 1200 SX TO SURFACE

**PROD. CASING**

NA

**PLUGGED FROM TD TO SURFACE w/CMT**

**API No. 21-133-36426-0000**

**GL @ 1107'**

**KB @ 1123'**

**WELL COMPLETION DATE: DRY HOLE (NA)**

**PLUGGING COMPLETION DATE: 2/19/83**

**TD @ 8440' KB**

MCCLAIN 1-28 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
1/15/1983	SPUD.
2/17/1983	DRILLING COMPLETED. FORMATION AT TD CINCINNATIAN. 24" CONDUCTOR SET AT 60' 13 3/8" SET AT 873'; 900 SX 9 5/8" SET AT 5472'; 1200 SX
2/18/1983	PLUGGING START DATE RUN DRILL PIPE TO 8440' AND SET 145 SX PULLED DRILL PIPE TO 8021' AND SET 515 SX PULLED DRILL PIPE TO 5500' AND SET 280 SX PULLED DRILL PIPE TO 3700' AND SET 280 SX PULLED DRILL PIPE TO 1900' AND SET 280 SX PULLED DRILL PIPE TO 100' AND SET 35 SX
2/19/1983	PLUGGING COMPLETED.



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

MAR 8 1983

PERMIT NUMBER

36426

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Willmet, Inc. 2250 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Company 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT McClain #1-28						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE NW SW		SECTION 28	TOWNSHIP 17N	RANGE 8W	TOWNSHIP NAME Evart		
FOOTAGES (North/South) 460 Ft. from North		FOOTAGES (East/West) 859 Ft. from West		COUNTY NAME Osceola			
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		FOOTAGES (East/West)		COUNTY NAME			
Ft. from		Ft. from		Line of quarter section			
D A T E	DRILLING BEGUN 1-15-83		TOTAL DEPTH OF WELL Driller 8440 Log 8430		TYPE WELL Dry Hole		ELEVATIONS
	DRILLING COMPLETED 2-17-83		FORMATION AT T.D. Cincinnatian		FT. DRLD. - ROTARY TOOLS From 0 To 8440		
	WELL COMPLETED		PRODUCING FORMATION(S) None		FT. DRLD. - CABLE TOOLS From To		
				K.B. 1123		R.F. 1122	
				R.T. Grd. 1107			

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
24"	60'	-----	---				YES	NO
13 3/8"	873'	900 Sx	---			None		
9 5/8"	5472'	1200 Sx						

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
None							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Traverse	Gas	3500						
				Reed City Dol	Gas	4050						
				Sour Zone	Gas	4580						

STIMULATION BY ACID OR FRACTURING

Bass Island Gas 5600  
Strickler Zone 8250  
WATER FILL UP (IF) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	None						

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	0 - 8430			2700	2°			
Birdwell		DLL-MLL	3300 - 8270			4300	1 3/4°			
		Sonic	200 - 8430			6500	1 1/2°			
		RFT	8220 - 8232			8000	2°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
-----	-----	-----	-----	-----	-----	-----

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 2/25/83	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E. Booker</i>
-----------------	--	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

REPLACING HAS COPY.

MAR 7 1983

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER

36426

FILE NAME

MAY 20 1983

MAY 27 1983

SEP 17 1984

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

Willmet, Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

McClain

WELL NUMBER

1-28

WELL LOCATION

NE 1/4 NW 1/4 SW 1/4 SEC. 28 T. 17N R. 8W

TOWNSHIP

Evart

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole

TOTAL DEPTH

8440

FORMATION

Cincinnatian

DATE PLUGGING STARTED

2-18-83

DATE PLUGGING COMPLETED

2-19-83

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Snider

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	60'	---	
13 3/8"	873'	---	
9 5/8"	5472'	---	

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	8440 - 8021	145 Sx
Cement	8021 - 5500	515 Sx
Cement	5500 - 3700	280 Sx
Cement	3700 - 1900	280 Sx
Cement	1900 - 100	280 Sx
Cement	0 - 100	35 Sx

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Dowell

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Marvin Woods

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Run drill pipe to 8440 and set 145 sx, pulled drill pipe to 8021 and set 515 sx, pulled drill pipe to 5500 and set 280 sx, pulled drill pipe to 3700 and set 280 sx, pulled drill pipe to 1900 and set 280 sx, pulled drill pipe to 100 and set 35 sx.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William E. Booker, Geologist

COMPANY NAME AND ADDRESS

Strickler Geological Services, Inc.  
1425 S. Mission  
Mt. Pleasant, MI 48858

SIGNATURE

DATE (Month, Day, Year)

2/28/83

## OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

**Supplemental Plugging Data and Site Conditions:**

6/14/84 -

Site is clean and recontoured. There were no brine seeps and grass has grown in.  
Okay for final approval.

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

**SIGNATURE**

DIVISION

DATE \_\_\_\_\_

Michael J. Moss

# GEOLOGICAL SURVEY

6/15/84

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

PERMIT TO PLUG AND ABANDON

OWNER DISTRIBUTION  
Permittee - Orig. & 1 copy  
Division Office - 2 copies  
Field Office - File copy  
Others - On request

PERMIT NUMBER 36426  
FIELD NAME Wildcat

NAME AND ADDRESS OF PERMITTEE  
Willmet

LEASE NAME AND WELL NO.  
McClain #1-28

LOCATION (1/4, 1/2, 3/4 or other) SECTION TOWNSHIP COUNTY  
NE NW SWF 28 T 17N R 8W Evart Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.) DATE COMPLETED DATE PLUGGING WILL START PLUGGING PERMIT REQUESTED BY & DATE  
Dry hole 2/17/83 2/18/83 2/18/83 M. Woods

LAST PRODUCTION BOPD BWPD MCFGPO DATE PLUGGING TO BE DONE BY  
Provins #7

PERMIT MAILED TO COPIES MAILED TO  
Willmet

CASING AND CEMENTING RECORD

HOLE DIA	CASING DIA & WT./FT	DEPTHS SET	CEMENT QUANTITY TYPE ADDITIVES	CMT TOP	PERFORATIONS
	24"	60'			
	133/8"	873'	900	surf	
	95/8"	5474'	1200	125'	

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

CONFIDENTIAL

PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1961, as amended, and rules and orders adopted thereunder.

P.I. as per Mineral Wells:

Circl. Class A cmt. to top Niag. Circl. 50-50 poz cmt. to within 100' of ground level.

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1971 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature) OFFICE DATE  
Michael J. Woods Cadillac D#6 2/22/83

\*SEE WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

H-7229  
Rev 11/77

This document paid for with State funds



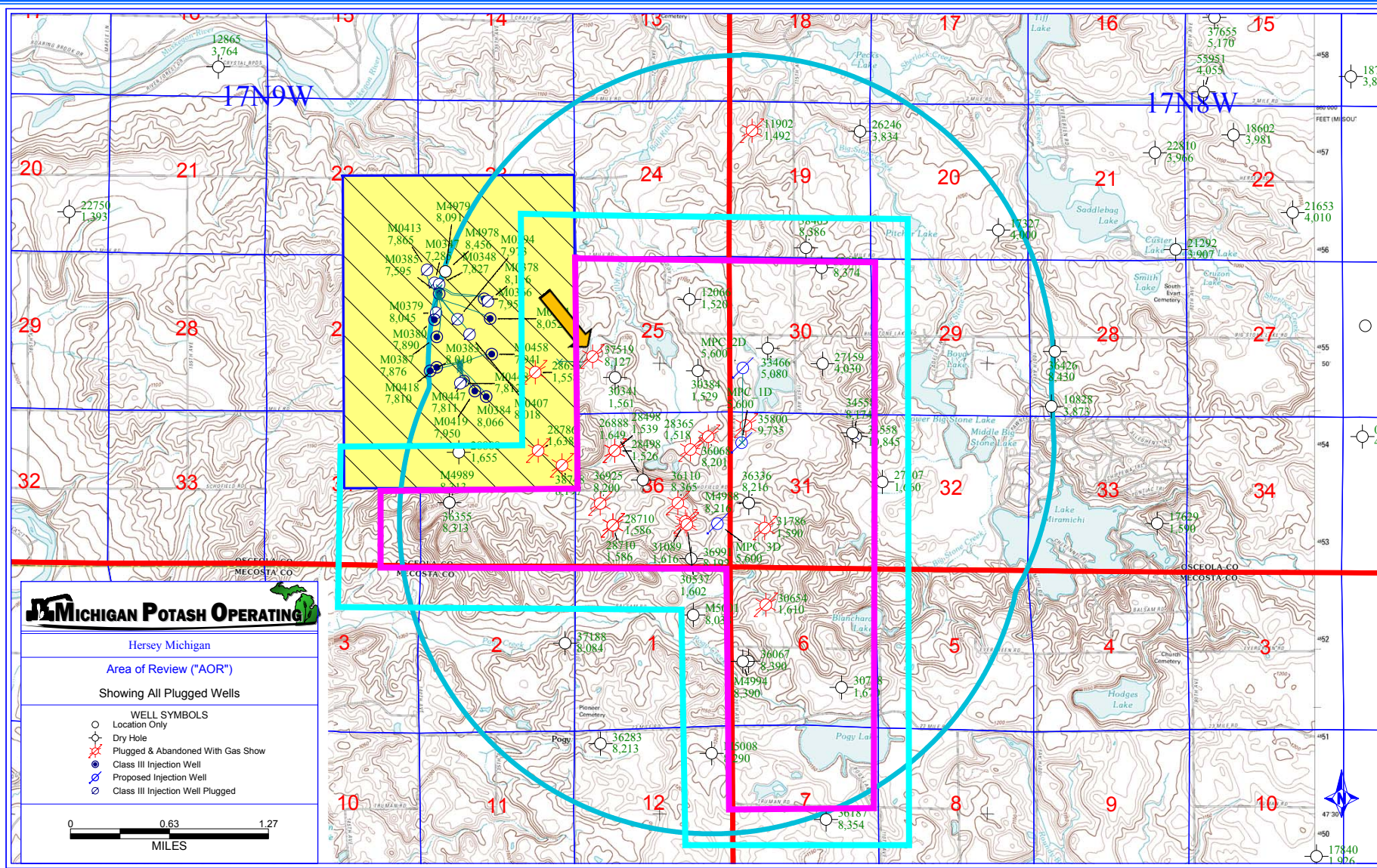


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**MILLER 1-25**  
**SE NE SE Sec 26 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

API No. 21-133-37519-0000  
GL @ 1122.9'  
KB @ 1139.7'  
WELL COMPLETION DATE: 9/1/84  
PLUGGING COMPLETION DATE: 8/4/95

925'-580' 100 SX CL "A" CMT

2046'-1742' 75 SX CL "A" CMT

5400'-4947' 50 SX CL "A" CMT

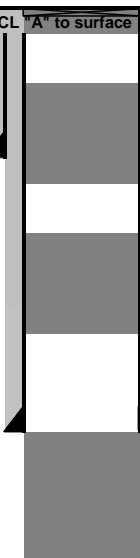
7206'-7000' 25 SX CL "H" CMT

PBTD 7659'

PB 8070' - 7659' w/200 SX CL H CMT

8070'  
8290'-8063' 25 SX CLASS "H" CMT

CMT RETAINER 8290'



**SURFACE CASING**  
16"; 65#/ft.  
SET @ 615' KB  
CMT w/550 SX TO SURFACE

14-3/4" Hole  
**INTERMEDIATE CASING**  
11-3/4"; 60#/ft.  
SET @ 915' KB  
CMT w/ 200 SX HOWCOLITE w/3% cc  
+ 200 SX "A" w/3% cc  
CMT TO SURFACE

10-5/8" Hole  
**INTERMEDIATE CASING**  
8 5/8"; 32#/ft.  
SET @ 5432' KB  
2 STAGES:  
#1: 450 SX POXMIX + 200 SX CLASS "A" ; DV TOOL @3763'  
#2: 700 SX POXMIX + 100 SX CLASS "A"  
CMT TO SURFACE

**PROD. CASING**  
5-1/2"; 17#/ft.  
SET @ 8426' KB  
CMT w/800 SX POXMIX w/6% GEL AND 1/4# SK D-AIR  
+ 160 SX CLASS "H" w/0.25% WG-17 & 0.25% C-331  
TOC

**BURNT BLUFF PERFS**  
8328'-8343' (30x)

TD @ 8425' KB  
PBTD @ 7659'

## MILLER 1-25 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
7/9/1984	SPUD.
9/13/1984	PERFORATED 30 HOLES, 2/FT: 8328'-8343'
9/1/1984	WELL COMPLETED. FORMATION AT TD CABOT HEAD. 16" SETAT 615'; 550 SX CMT 11-3/4" SET AT 915'; 200 SX HOWCO LITE w/3% cc + 200 SX "A" w/3% cc 8-5/8" SET AT 5432'; 2 STAGES: #1 450 SX POZMIX +200 SX CLASS "A" DV TOOL @ 3763', #2 700 SX POZMIX + 100 SX CLASS "A" 5-1/2" SET AT 8425'; 800 SX POXMIX w/6% GEL AND 1/4#/SK D-AIR + 160 SX CLASS "H" w/0.25% WG-17 & 0.25% C-331
7/31/1995	PLUGGING STARTED
8/1/1995	RU HALLIBURTON TO KILL WELL. 1,000 PSI ON TUBING. PUMPED 55 BBL 10.2 BRINE DOWN TUBING. FILLED CASING 42 BBL. ND TREE. NU BOP. START OUT WITH TUBING. GOT OUT WITH TUBING. RU HALLIBURTON WIRELINE. MAKING GAUGE RING AND JUNK BASKET RUN. RAN 5,000'. SHUT IN UNTIL AM.
8/2/1995	PREPARE TO CUT 5-1/2" CASING BELOW SLIPS. FINISH TIH w/TUBING, TAG CMT RETAINER @ 8290'. RU HALLIBURTON AND KAL-CON, STING OUT OF RETAINER AND LOAD HOLE w/115 BBLs BRINE. STING INTO RETAINER. PUMP 25 SX CLASS H CMT THRU RETAINER, STING OUT OF RETAINER AND SPOT 25 SX CLASS H CMT ON TOP OF RETAINER. PULL TUBING TO 7206'. REVERSE CIRCULATE TO FILL HOLE AND SPOT A 25 SX CLASS H CMT PLUG FROM 7000'-7206'. TOO H w/TUBING (STAND BACK 70 STAND-LAY DOWN REST). ND BOP'S AND TUBING HEAD. SPEAR 5-1/2" CASING AND ATTEMPT TO PULL BUT UNSUCCESSFUL. SDFN.
8/3/1995	RU ENTERRA OILFILED TOOLS CASING CUTTER, CUT 5-1/2" CASING 1' BELOW SLIPS AND REMOVE FROM HOLE. RU HALLIBURTON WIRELINE AND FREEPOINT CASING (NO MOVEMENT BELOW 2500'). 50% @ 2200'. 70% @ 2000'. RU CUTTER AND CUT CASING @ 2000'. RD HALLIBURTON, RU CASING TOOLS, PULL AND LAY DOWN 2000' OF 5-1/2" CASING (49 FULL JOINTS - 2 CUTOFFS). RD CASING TOOLS, TIH WITH TUBING TO 4400'. RADIATOR HOSE BROKE ON RIG, DOWN FOR REPAIRS. FINISH TIH WITH 2-7/8" TUBING TO 5400'. SD FOR EVENING.
8/4/1995	PLUGGING COMPLETE. RU HALLIBURTON AND KAL CON, BREAK CIRCULATION AND SPOT A 50 SX CLASS A CMT PLUG AT 5400'. TOO H LAYING DOWN TUBING TO 2046', WHERE A 75 SX CLASS A CMT PLUG WAS SPOTTED. TUBING WAS PULLED TO 925' WHERE A 100 SX CLASS A CMT PLUG WAS SPOTTED. TOO H TO 50', SPOT A 15 SX CLASS A CMT PLUG TO SURFACE, RIG DOWN AND RELEASE HALLIBURTON. CUT OFF HEAD AT GROUND LEVEL IN CELLAR AND WELD A 1/2" STEEL PLAT ON TOP. FOLLOWING ARE TOP AND BOTTOM FOOTAGE FOR INDIVIDUAL CMT PLUGS: PLUG SPOTTED AT 8290', 25 SX, TOP OF PLUG AT 8063' PLUG SPOTTED AT 7200', 25 SX, TOP OF PLUG AT 7000' PLUG SPOTTED AT 5400', 50 SX, TOP OF PLUG AT 4947' PLUG SPOTTED AT 2000', 75 SX, TOP OF PLUG AT 1742' PLUG SPOTTED AT 925', 100 SX, TOP OF PLUG AT 580' PLUG SPOTTED AT 50', 15 SX, TOP OF PLUG AT SURFACE



## REQUEST FOR TRANSFER OF A PERMIT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

Filing for change of ownership of well is required in accordance with ☒ Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO 37519	WELL TYPE Gas
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER Miller 1-25	
WELL LOCATION SE 1/4 NE 1/4 SE 1/4 SECTION 26 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

## TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil &amp; Gas Co., Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil &amp; Gas Co., Inc., Mr. Donald R. Hall

*Donald R. Hall* 12/14/87

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

## TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐ SINGLE WELL☐ ATTACHED

BONDING CO. SAFECO Insurance Company of America

☒ BLANKET☒ ON FILE

BOND NUMBER 5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Mr. David W. Hoopman

*David W. Hoopman*

12/16/87

## FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*S. J. [Signature]*

Signature

6/28/88

Date

DISTRIBUTION BY DNR

☒ Lansing☐ Acquiring Owner☐ Selling Owner☐ Field



OCT 10 1984

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES

## LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)

Submit in DUPLICATE Within 30 Days after Well Completion

PERMIT NUMBER

37519

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG OIL & GAS, INC. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) INDRIL, INC. PO Box 668 Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT MILLER #1-25						DIRECTIONALLY DRILLED YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	
SURFACE LOCATION SE NE SE		SECTION 26	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 852 Ft. from North		Line and 560		FOOTAGES (East/West) Ft. from East		COUNTY NAME Osceola	
SUBSURFACE LOCATION SW NW SW		SECTION 25	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 634 Ft. from South		Line and 558		FOOTAGES (East/West) Ft. from West		COUNTY NAME Osceola	
DATE	DRILLING BEGUN 7/9/84		TOTAL DEPTH OF WELL Driller 8425 Log 8424		TYPE WELL Gas well		ELEVATIONS
	DRILLING COMPLETED 8/8/84		FORMATION AT T.D. Cabot Head		FT. DRD. - ROTARY TOOLS From 0 To 8425		
	WELL COMPLETED 9/1/84		PRODUCING FORMATION(S)		FT. DRD. - CABLE TOOLS From To		
						K.B. 1139.7	R.F. 1138.3
						R.T.	Grd. 1122.9

## CASING, CASING LINERS AND CEMENTING

## PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
16"	615'	550 sx	--				YES	NO
11-3/4"	915'	400 sx	--	9/13/84	2/ft	8328-8343 (30x)	X	
8-5/8"	5432'	650 sx 1st stage						
	DV tool 03763	310sx 2nd. stage						
5 1/2"	8426	960sx						

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
Burnt Bluff	Gas	8327	8358MD				Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
		8050	8075TVD	Reed City	Gas	4075					X	
				Antrim	Gas	3010					X	

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
9/13/84	8328-43	500 gal. 15%	None				

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	FUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	100-8420			See attached				
Birdwell		Sonic	6600-8420							
		DLL-MLL	3150-5429							
			7000-8422							

## PRODUCTION TEST DATA

OIL -- Bbls/day	GRAVITY -- °API	COND. Bbls/day	GAS -- MCF/day	WATER -- Bbls/day	H <sub>2</sub> S -- Grains/100 cu. ft.	B.H.P. AND DEPTH
--	--	--	1,000	--	--	--

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
9/20/84	William E. Booker, Geologist	<i>William E. Booker</i>

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77



# OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

Supplemental Plugging Data and Site Conditions:

WELL WAS SIDETRACKED UNDER SAME PERMIT #

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

SIGNATURE

DIVISION

DATE

Michael J. [Signature]

GEOLOGICAL SURVEY

8/15/84

UNR DISTRIBUTION  
Permittee — Orig. & 1 copy  
Division Office — 2 copies  
Field Office — File copy  
Others — On request

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

PERMIT NUMBER  
37519 lost hole

FIELD NAME  
Persey

PERMIT TO PLUG AND ABANDON

NAME AND ADDRESS OF PERMITTEE

PPG

LEASE NAME AND WELL NO.

Miller #1-25 lost hole

LOCATION (1/4 1/4 or other)

SE NE SE,

SECTION

25

T 17N R 19W

TOWNSHIP

Persey

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Lost hole

DATE COMPLETED

8/1/84

DATE PLUGGING WILL START

8/1/84

PLUGGING PERMIT REQUESTED BY & DATE

W. Booker 8/1/84

LAST PRODUCTION

BOPD

BWPD

MCFGPD

DATE

PLUGGING TO BE DONE BY

Indril #7

PERMIT MAILED TO

COPIES MAILED TO

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT/FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP.	PERFORATIONS
	24"	46			
	16"	615	550	surf	
	11 3/4"	915	400	"	
	85/8"	5432	1450	"	

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

MEASURED DEPTHS: CONFIDENTIAL.

A1E 7665

BN1a 8047

T.D. 8077

PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

NOTE: Well to be P.B. for deviation correction. Well to be plugged back w/cmt. to approx. 7650'.

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

*William J. Moss*

OFFICE Cadillac #6

DATE

8/1/84

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

R-7229  
Rev. 11/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

FEB 18 1994

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☐ CHANGE WELL STATUS ☒ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION/INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

1 MCFD

WORK TO BE DONE BY: ☐ APPROVAL MAILED

To Be Determined

PERMIT NO.

37519

TYPE OF WELL

Gas Producer

NAME AND ADDRESS OF WELL OWNER ☐ APPROVAL MAILED

Marathon Oil Company  
1231 E. Mosherville Road  
Jonesville, MI 49250

FIELD/FACILITY NAME

Hersey Unit

WELL NAME

Miller

WELL NO.

#1-25

WELL LOCATION

SW 1/4 of NW 1/4 of SW 1/4 Section 25 T 17N R 9W

TOWNSHIP

Hersey

COUNTY

Osceola

DATE DRILLING COMPLETED

8-11-84

DATE LAST PRODUCED/UTILIZED

Active

STARTING DATE

A.S.A.P.

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT. FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
14 3/4"	16", 65#	615'	N/A		
10 5/8"	11 3/4", 60#	915'	200 SX Howcolite w/3% cc + 200 sx "A" w/3% cc	Surface	
7 7/8"	8 5/8", 32#	5432'	*	Surface	
	5 1/2", 17#	8425'	**		8328-43'

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

SEE ATTACHED "EXHIBIT A"

\* 1ST STAGE: 450 SX POZMIX + 200 SX CLASS "A" DV TOOL @ 3763'.  
2ND STAGE: 700 SX POZMIX + 100 SX CLASS "A".

\*\* 800 SX POZMIX W/6% GEL AND 1/4#/SK D-AIR + 160 SX CLASS "H" W/0.25% WG-17 & 0.25% C-331.

DETAIL PROPOSED PROCEDURES:

See Attached

GEOLOGICAL SURVEY

1994

Permits & Bonding Unit

DNR ADDITIONAL REQUIREMENTS:

NAME/SIGNATURE (Authorized Representative)

M. R. Daniels, Jr., Michigan Production Superintendent

DATE

2/4/94

APPROVED BY DNR

OFFICE

APPROVAL DATE

TERMINATION DATE

Michael J. Norris

CADILLAC

MAR 08 1994

NOTE. THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.



Permit Number  
37519

Well Name & Number  
MILLER #1-25

## RECORD OF WELL PLUGGING OR REWORK

REQUIRED BY AUTHORITY OF: ACT 61, PA 1939, as amended or ACT 315, PA 1969, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Type of Well Gas

Field Name Hersey Unit

1/4 1/4 1/4, Section, Township, Range, County  
SW, NW, SW, Section 25-T17N-R9W, Osceola County

Date Plugging / Rework Started  
7/31/95

Date Plugging / Rework Completed  
8/04/95

Name and Address of Well OWNER  
MARATHON OIL COMPANY  
4445 E. MOSHERVILLE ROAD  
JONESVILLE, MI 49250

Name and Address of Contractor/Service Company  
(attach additional sheets as needed)  
McConnell & Scully, 26761 L Drive S, Homer, MI 49245  
Halliburton, PO Box 374, Mt. Pleasant, MI 48804

Indicate Operation & Type of Well Permit  
☐ PLUGGING ☐ REWORK ☐ Act 61 Oil & Gas ☐ Act 315 Mineral Wells

Name of DNR employee issuing Plugging Permit or Approving Change of Well Status Michael J. Moss Date Issued 3/8/94

☐ Tools, tubing, etc. left in hole - describe in Daily Chronology.

☐ Well logs run - list types and depths in Daily Chronology.

### For WELL PLUGGING Only (HOLE CONDITIONS AFTER PLUGGING)

CASING				PLUGS			
Casing Size	Where Set	Amount Casing Pulled	Depth Casing Cut/Perforated: Windows Milled	Depth Bottom Top	Type of Bridge or Plug	Cement Plugs: Cement type, # sx, and additives	Tagged Top? Y/N
16"	615'	4'	4'	8290'	8290'	Cement Retainer	Y
11-3/34"	915'	4'	4'	8290'	8063'	Cement	25 sx Class "H" N
8-5/8"	5432'	4'	4'	7206'	7000'	Cement	25 sx Class "H" N
5-1/2"	8425'	2000'	2000'	5400'	4947'	Cement	50 sx Class "A" N
				2046'	1742'	Cement	75 sx Class "A" N
				925'	580'	Cement	100 sx Class "A" N
				50'	Surf	Cement	15 sx Class "A" N

Check ☐ if NORM material was reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on back of this form.

### For WELL REWORK Only

REWORK WAS TO: ☐ TEMPORARILY ABANDON  
☐ CONVERT TO: ☐ Disposal Well ☐ Production ☐ Storage ☐ Enhanced Recovery ☐ Other  
☐ REMEDIAL: ☐ Perf & Test ☐ Repair Casing/Cement ☐ Redrill ☐ Other  
☐ PLUGBACK: ☐ New Production Zone ☐ Disposal ☐ Storage ☐ Enhanced Recovery ☐ Other

### Well Casing Record - BEFORE Rework

Casing		Cement		Perforations			Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### Well Casing Record - AFTER Rework (indicate additions and changes only; complete Test Record on next page)

Casing		Cement		Perforations			Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	

### BEFORE REWORK

### AFTER REWORK

Total Depth	Formation/Zone	Well Completed For	Total Depth	Formation/Zone	Well Completed For



DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
August 1, 1995

WORKOVER/RECOMPLETION

Hersey Unit  
Miller 1-25  
Osceola County, MI  
AFE NO:  
AFE AMOUNT:

OPERATOR: Marathon Oil  
RIG: McConnell/Scully Rig54  
MOC/WI:  
MIRU: 07/31/95

---

COST TO DATE:

DAY: 1

PRESENT OPERATION: Rig up to plug and abandon.

REMARKS: 07/31/95: 7:00 - Drove to location to plug well. 10:00 - Arrived on location to spot equipment. 11:00 - Spotted BOP's and adaptors on location. 13:00 - Enterra delivered and spotted liners, tanks and tools. 14:00 - Rig 54 on location. Spot on liners. Rig up KalCon Construction. Fill tanks with 10.2 state approved brine. Unhook flow lines from well head, rigged up flow line from half tank. 18:00 - Release rig crew until AM.

---

DAY: 2

REMARKS: 08/01/95: 7:00 am - On location, rigged up Halliburton to kill well. 1,000 psi on tubing. Pumped 55 bbl 10.2 brine down tubing. Filled casing 42 bbl. Nippled down tree. Nippled up BOP. Start out with tubing. Got out with tubing. Rigged up Halliburton Wireline. Making gauge ring and junk basket run. Ran in cement retainer and set at 8290'. Start in with tubing. Ran 5,000'. Shut in until morning.

---

DAY: 3

REMARKS: 08/02/95: 7 am - prepare to cut 5-1/2" casing below slips. Finish TIH w/tubing, tag cement retainer @ 8290'. RU Halliburton and Kal-Con, sting out of retainer and load hole w/115 bbls brine. Sting into retainer. Pump 25 sx Class H cement thru retainer, sting out of retainer and spot 25 sx Class H cement on top of retainer. Pull tubing to 7206'. Reverse circulate to fill hole and spot a 25 sx Class H cement plug from 7000'-7206'. TOOH w/tubing (stand back 70 stands-lay down rest). ND BOP's and tubing head. Spear 5-1/2" casing and attempt to pull but unsuccessfully. SDFN.

---



DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
August 4, 1995

WORKOVER/RECOMPLETION

Hersey Unit  
Miller 1-25  
Osceola County, MI  
AFE NO:  
AFE AMOUNT:

OPERATOR: Marathon Oil  
RIG: McConnell Rig 54  
MOC/WI:  
MIRU: 07/31/95

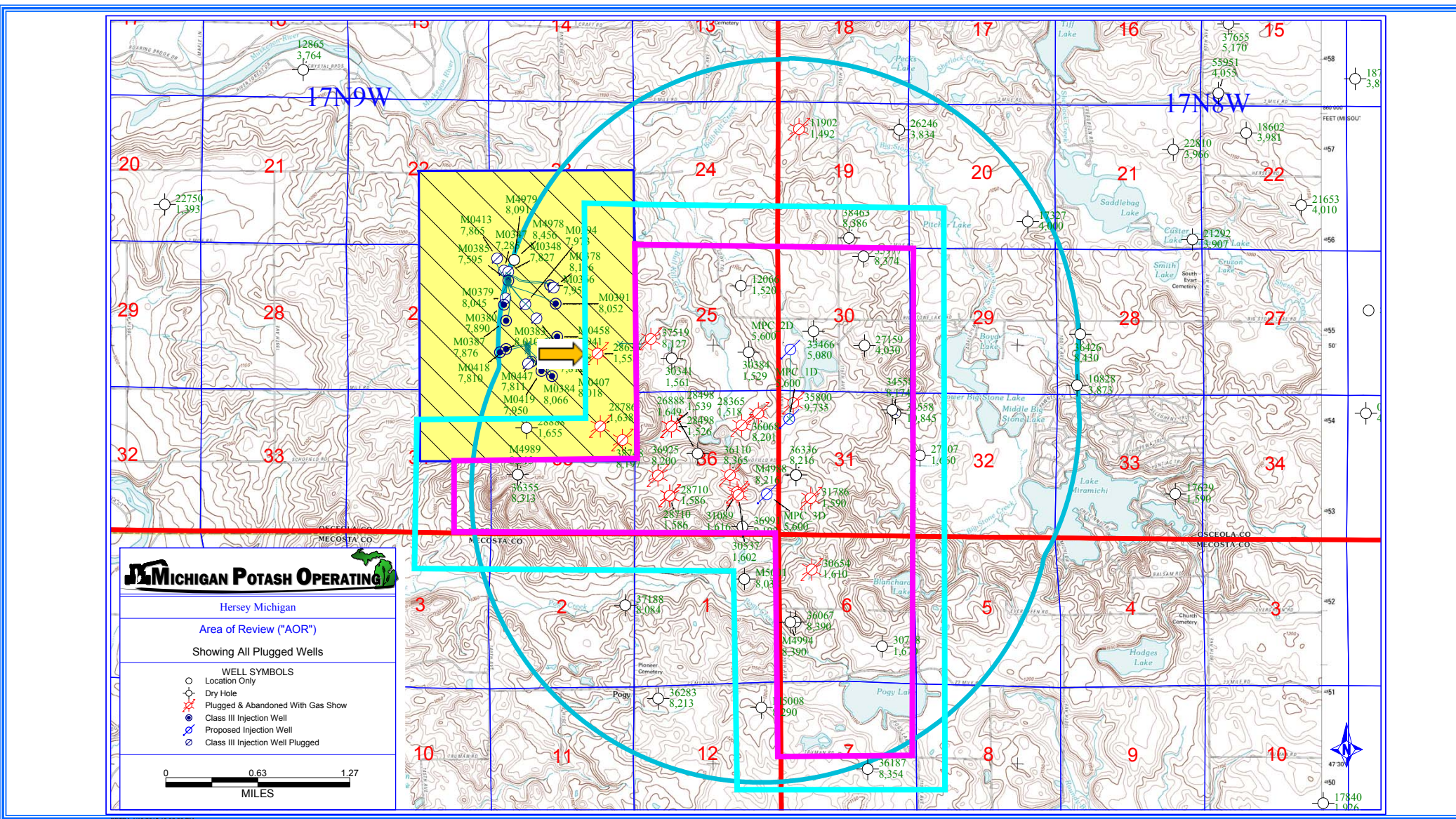
DAY: 4

REMARKS: 08/03/95: 7 am RU Enterra oilfield tools casing cutter, cut 5-1/2" casing 1' below slips and remove from hole. RU Halliburton Wireline and freepoint casing (no movement below 2500'). 50% @ 2200'. 70% @ 2000'. RU cutter and cut casing @ 2000'. RD Halliburton, RU casing tools, pull and lay down 2000' of 5-1/2" casing (49 full joints - 2 cutoffs). RD casing tools, TIH with tubing to 4400'. Radiator hose broke on rig, down for repairs. Finish TIH with 2-7/8" tubing to 5400'. SD for evening. Hal Fitch (DNR-Cadillac) was consulted concerning the cutting of the casing being shallower than planned and recommended changes to the rest of the plugging procedure which deviate from the original prognosis. 7 AM (8-4-95) Prepare to set final plugs and cap well.

DAY: 5

REMARKS: 08/04/95: Plugging complete. RU Halliburton and Kal Con, break circulation and spot a 50 sx Class A cement plug at 5400'. TOOH laying down tubing to 2046', where a 75 sx Class A cement plug was spotted. Tubing was pulled to 925' where a 100 sx Class A cement plug was spotted. TOOH to 50', spot a 15 sx Class A cement plug to surface, rig down and release Halliburton. Cut off head at ground level in cellar and weld a 1/2" steel plate on top, well number 1-25 and date 8-4-95 was etched in top of cap. RD completion unit and move to Grein 1-35, also move frac tank and 1/2 tank. SD for weekend. Following are top and bottom footage for individual cement plugs:

Plug spotted at 8290', 25 sx, top of plug at 8063'  
Plug spotted at 7200', 25 sx, top of plug at 7000'  
Plug spotted at 5400', 50 sx, top of plug at 4947'  
Plug spotted at 2000', 75 sx, top of plug at 1742'  
Plug spotted at 925', 100 sx, top of plug at 580'  
Plug spotted at 50', 15 sx, top of plug at surface.



**Paine 1-26**  
**SE NE SE Sec 26 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

API No. 21-133-37317-0000

GL @ 1124'

KB @ 1140'

WELL COMPLETION DATE: 5/18/84

PLUGGING COMPLETION DATE:

LOST HOLE PB TO SURFACE w/

PLUG @ 670' 250 SX HOWCOLITE CaCl

PLUG @ 105' 175 SX CLASS A, 3% CaCl

RIG SKIDDED 30' N AND NEW WELL DRILL ON SAME PAD

**SURFACE CASING**

16"; 65#/ft.

SET @ 625' KB

CMT w/450 SX HOWCOLITE/100 SX CLASS A w/3% CaCl TO SURFACE

625'

911'

14-3/4" Hole

**INTERMEDIATE CASING**

11-3/4"; 60#/ft.

SET @ 911' KB

CMT w/ 170 SX HOWCOLITE/200 SX CLASS A w/3% CaCl TO SURFACE

5408'

**PER TEMP SURVEY:**

TOP OF POOR CMT @ 630', TOP OF GOOD CMT @ 2030', PLUG @ 3033'

TOP OF POOR CMT @ 40'

10-5/8" Hole

**INTERMEDIATE CASING**

8 5/8"; 32#/ft.

SET @ 5408' KB

CMT w/1100 SX HOWCOLITE/200 SX CLASS A w/2% CaCl TO SURFACE

LAST PRODUCING @ 296 MCFD OF GAS/DAY

**PROD. CASING**

5-1/2"; 17#/ft.

SET @ 8090' KB

CMT w/300 SX HOWCOLITE w/18% SALT/425 SX POZMIX w/18% SALT/  
160 SX SPECIAL H TO SURFACE

7-7/8" Hole

**BURNT BLUFF PERFS**

8026'-8045' (38x)

**BURNT BLUFF REPERFS**

8024'-8044' (4spf)

TD @ 8095' KB  
PB TO SURFACE (LOST HOLE)



**Paine 1-26 Well History**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
1/5/1984	SPUD.
1/12/1984	LOST HOLE. PLUGGED BACK TO SURFACE. FIRST PLUG AT 670', 250 SX HOWCOLITE CaCl. SECOND PLUG AT 105', 175 SACKS, CLASS A, 3% CaCl. HAD CIRCULATION ON BOTH PLUGS, HOLE STAYED FULL. HAD 3 BARRELS CEMENT RETURN TO SURFACE ON SECOND PLUG. RIG SKIDDED ABOUT 30' N AND NEW WELL DRILLED ON SAME PAD.
2/15/1984	RUSC. MAKE GR RUN TO 8050'. ROH. RU 20' OF 2-1/8" THRU-TUBING PERFORATING GUNS LOADED TO SHOOT 4 SPF. RIH w/PERFORATING GUN. USING CCL, POSITION GUN TO PERFORATE 8024'-8044'. ONCE ON DEPTH, FIRE GUNS & ROH. RDSC. RETURN WELL TO PRODUCTION.
5/18/1984	PERFORATED 38 HOLES: 8026'-8045'
5/18/1984	WELL COMPLETED. FORMATION AT TD CABOT HEAD. PRODUCING FM BURNT BLUFF. 16" SET AT 625'; 450 SX HOWCOLITE/100 SX CLASS A w/3% CaCl 11-3/4" SET AT 911'; 170 SX HOWCO LITE/200 SX CLASS A w/3% CaCl 8-5/8" SET AT 5408'; 1100 SX HOWCOLITE/200 SX CLASS A w/2% CaCl 5-1/2" SET AT 8090'; 300 SX HOWCOLITE w/18% SALT/425 SX POZMIZ w/18% SALT/160 SX SPECIAL H  LAST PRODUCTION/DAY: 296 MCFD OF GAS

STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

PERMIT NO 37317	WELL TYPE Gas
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER Paine 1-26	
WELL LOCATION SE 1/4 NE 1/4 SE 1/4 SECTION 26 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

Filing for change of ownership of well is required in accordance with ☒ Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil & Gas Co., Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil & Gas Co., Inc., Mr. Donald R. Hall

*Donald R. Hall* 12/14/87

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐

SINGLE WELL

☐

ATTACHED

BONDING CO.

SAFECO Insurance Company of America

☒

BLANKET

☒

ON FILE

BOND NUMBER

5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Mr. David W. Hoopman

*David W. Hoopman*

12/16/87

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

DISTRIBUTION BY DNR

☒ Lansing

☐ Acquiring Owner

☐ Selling Owner

☐ Field

APPROVED

*L. J. Szyganski*  
Signature

6/28/88  
Date

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in DUPLICATE Within 30 Days after Well Completion

PERMIT NUMBER  
37317  
DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT P.P.G. Oil & Gas Co., Inc. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Company, Inc. 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Paine #1-26						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION SE/4, NE/4, SE/4		SECTION 26		TOWNSHIP 17N		RANGE 9W	
FOOTAGES (North/South) 822 Ft. from N		Line and 560		Ft. from E		Line of quarter section	
TOWNSHIP NAME Hersey		COUNTY NAME Osceola					
SUBSURFACE LOCATION		SECTION		TOWNSHIP		RANGE	
FOOTAGES (North/South)		Line and		Ft. from		Line of quarter section	
TOWNSHIP NAME		COUNTY NAME					
DRILLING BEGUN 1-5-84		TOTAL DEPTH OF WELL Driller 8095 Log 8098		TYPE WELL Gas		ELEVATIONS	
DRILLING COMPLETED 2-16-84		FORMATION AT T.D. Cabot Head		FT. DRLD. - ROTARY TOOLS From 0 To 8098		K.B. 1140'	R.F. 1139'
WELL COMPLETED 5-18-84		PRODUCING FORMATION(S) Burnt Bluff		FT. DRLD. - CABLE TOOLS From To		R.T.	Grd. 1124'

**CASING, CASING LINERS AND CEMENTING**

**PERFORATIONS**

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
							YES	NO
16"	625'	550	-					
11 3/4"	911'	370	-	5-18-84	38	8026' to 8045'	X	
8 5/8"	5403'	1400						
5 1/2"	8090'	885						

**GROSS PAY INTERVALS**

**ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED**

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
							Sam- ples	Other	Pres	Mud Line	Gas Log	Fill Up
Burnt Bluff	Gas	8014'	8045'	None								

**STIMULATION BY ACID OR FRACTURING**

**WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)**

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
5-18-84	8026-8045'	500 gal 20% Fe acid	None				

**MECHANICAL LOGS, LIST EACH TYPE RUN**

**DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK**

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTN	RUN AT.	DEGREES	YES	NO	DEPTH
Schlumberger	X	Sonic/GR	6400-8095'	1288'	1 1/2°					
Birdwell		DLL-MLL/GR	3250-8095'	3332'	0°					
		LDI/CNI	100-8095'	7832'	1°					

**PRODUCTION TEST DATA**

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
0	-	0	1155	0	0	Est. 4671 @ 8044'

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
6/21/84	Randall L. Schroeder - Senior Engineer	<i>Randall L. Schroeder</i>

NOTICE REPORT COMPLETE SAMPLES AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

WELL PLUGGING RECORD

(Submit in TRIPlicate Within 30 Days After Plugging is Completed)

*Lost Hole*

PLUG HAS COPIED

PERMIT NUMBER

1984317

LOST HOLE

JAN 20 1984

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc.

COMPLETE LEASE OR FARM NAME(S)

Paine

WELL NUMBER

1-26

WELL LOCATION

SE 1/4 NE 1/4 SE 1/4 SEC. 26 T. 17N R. 9W

TOWNSHIP

Hersey

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole (LOST HOLE)

TOTAL DEPTH

FORMATION

DATE PLUGGING STARTED

1-12-84

DATE PLUGGING COMPLETED

1-12-84

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Discussed with Jack Snider

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
20"	77'	None	

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	670-105	250 HOWCOLite
	105-0	175 Class A

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging: Don Smith, Marvin Woods

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED Plugged back to surface.

First plug at 670', 250 sacks HOWCOLite CaCl.

Second plug at 105', 175 sacks, Class A, 3% CaCl.

Had circulation on both plugs, hole stayed full. Had 3 barrels cement return to surface on second plug.

Rig skidded about 30' N and new well drilled on same pad.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

Donald D. Metzger

Director, Exploration & Michigan Operations

COMPANY NAME AND ADDRESS

PPG Oil & Gas Co., Inc.  
2258 Enterprise Drive  
Mt. Pleasant, MI 48858

SIGNATURE

*Donald D. Metzger*

DATE (Month, Day, Year)

1-16-84

# OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

Supplemental Plugging Data and Site Conditions:

1/30/84 rig skidded about 30' N and new well drld. on same pad.  
(M. MOSS)

Regulatory Control Unit  
MAR 14 1984  
GEOLOGICAL SURVEY

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

SIGNATURE	DIVISION	DATE
Michael J. Moss	CADILLAC	1/30/84



DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

## OWNER DISTRIBUTION

Permitted -- Orig & 1 copy  
Division Office -- 2 copies  
Field Office -- File copy  
Others -- On request

PERMIT NUMBER

37317 Lost hole

FIELD NAME

Hersey

## PERMIT TO PLUG AND ABANDON

NAME AND ADDRESS OF PERMITTEE

PDC

LEASE NAME AND WELL NO.

Paine #1-26 LOST HOLE

LOCATION (1/4 1/4 or other)

SE NE SE,

SECTION

26 T17N R 9E

TOWNSHIP

Hersey

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Lost hole

DATE COMPLETED

1/11/84

DATE PLUGGING WILL START

1/11/84

PLUGGING PERMIT REQUESTED BY &amp; DATE

D. Smith 1/11/84

LAST PRODUCTION

BOPD

BWPD

MCFGPD

DATE

PLUGGING TO BE DONE BY

PERMIT MAILED TO

COPIES MAILED TO

## CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP.	PERFORATIONS
	2 1/2"	72'			

## GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

T.D. 653'

## PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

Spot 425 ss cut from T.D. to surface. Shd' rin.

GEOLOGICAL SURVEY

JAN 23 1984

Regulatory Control Unit

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

*Michael J. Myers*

OFFICE

Cadillac #46

DATE

1/12/84

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

R-7229  
Rev. 11/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☒ CHANGE WELL STATUS ☐ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☒ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION / INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

296 MCFD of Gas

PERMIT NO.  
37317

TYPE OF WELL  
Gas

NAME AND ADDRESS OF WELL OWNER ☐ APPROVAL MAILED

Marathon Oil Company  
P.O. Box 68  
Jonesville, MI 49250

FEB 10 1992

FIELD/FACILITY NAME  
Hersey Unit

WELL NAME  
Paine

WELL NO.  
1-26

WELL LOCATION  
SE 1/4 of NE 1/4 of SE 1/4 Section 26 T 17N R 4W

TOWNSHIP  
Hersey

COUNTY  
Osceola

DATE DRILLING COMPLETED  
02-15-84

DATE LAST PRODUCED/UTILIZED  
Currently Producing

WORK TO BE DONE BY: ☐ APPROVAL MAILED  
To be Determined

STARTING DATE

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
20"	16", 65#	635'	450 sx Howco lite/100 sx Class A w/3% CaCl		
14-3/4"	11-3/4", 60#	911'	170 sx Howco lite/200 sx Class A w/3% CaCl		
10-5/8"	8-5/8", 32#	5408'	1100 sx Howco lite/200 sx Class A w/2% CaCl		
7-7/8"	5-1/2", 20#	8090'	300 sx Howco lite w/18% salt/425 sx Pozmix w/18% salt/160 sx Special H		8026-45

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

See Attached

DETAIL PROPOSED PROCEDURES:

RUSC. Make GR run to 8050'. ROH. RU 20' of 2-1/8" thru-tubing perforating guns loaded to shoot 4 spf. RIH w/perforating gun. Using CCL, position gun to perforate 8024'-8044'. Once on depth, fire guns & ROH. RDSC. Return well to production.

GEOLOGICAL SURVEY

FEB 11 1992

Permits & Bonding Unit

DNR ADDITIONAL REQUIREMENTS:

NAME/SIGNATURE (Authorized Representative)

N. R. Daniels, Jr., Michigan Production Supt.

DATE  
2/3/92

APPROVED BY DNR

OFFICE

APPROVAL DATE

FEB 10 1992

TERMINATION DATE

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.



## REQUEST FOR TRANSFER OF PERMIT

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

☒ Part 615 Oil/Gas Well☐ Part 625 Mineral Well

Permit number 37317	Well type Gas	Current true vertical depth 8090
Well name and number Paine 1-26		
Surface location SE 1/4 NE 1/4 SE 1/4 Section 26 T 17N R 9W		
Township Hersey		County Osceola

NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13)  
This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.

## TRANSFER OF A PERMIT FROM:

Name(s) of Selling Permittee(s) Marathon Oil Company		Fed. I.D.# or S.S.# 25-1410539	
Address: Number and Street, City or Town, State, ZIP Code Telephone 7301 NW Expressway Oklahoma City, OK. 73132		(405) 720-7373	
All permits rights and responsibilities are discharged by:			
Marathon Oil Company Permittee	Charles A. Paulson Authorized representative name	 Signature	8/2/00 Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date

## TRANSFER OF A PERMIT TO:

Name(s) of Acquiring Permittee(s): RSEC, L.L.C.		Fed. I.D.# or S.S.# 84-1533899	
Address: Number and Street, City or Town, State, ZIP Code 1200 17th Street, Suite 2350 Denver, CO 80202		Telephone (303) 892-5616	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <input type="checkbox"/> Blanket <input type="checkbox"/> On File Bond Number Pending Amount _____ <input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
RSEC, L.L.C. Permittee	Steve Swanson Authorized representative name	 Signature	8/3/00 Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date

## FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY

Approved Signature	MAY 31 2001 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner	
-----------------------	---------------------	--	--



## MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - GEOLOGICAL SURVEY DIVISION

## REQUEST FOR TRANSFER OF PERMIT

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

☒ Part 615 Oil/Gas Well☐ Part 625 Mineral Well

Permit number 37317	Well type Gas	Current true vertical depth 8090
Well name and number Paine 1-26		
Surface location SE 1/4 NE 1/4 SE 1/4 Section 26 T17N R9W		
Township Hersey		County Osceola

NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13). This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.

## TRANSFER OF A PERMIT FROM:

Name(s) of Selling Permittee(s) RSEC, L.L.C.		Fed. I.D.# or S.S.# 84-1533899	
Address: Number and Street, City or Town, State, ZIP Code Telephone 1200 17th Street, Suite 2350 Denver, CO 80202		(303) 892-5616	
All permits rights and responsibilities are discharged by:			
RSEC, L.L.C. Permittee	Steve Swanson Authorized representative name	 Signature PRESIDENT	8/5/02 Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date

## TRANSFER OF A PERMIT TO:

Name(s) of Acquiring Permittee(s): Whiting Petroleum Corporation		Fed. I.D.# or S.S.# 84-0918829	
Address: Number and Street, City or Town, State, ZIP Code 1700 Broadway, Suite 2300 Denver, CO 80290-2300		Telephone (303) 837-1661	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <u>Travelers Casualty Surety Co.</u>			
<input checked="" type="checkbox"/> Blanket <input checked="" type="checkbox"/> On File Bond Number <u>103847277</u> Amount <u>\$250,000</u>			
<input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
Whiting Petroleum Corporation Permittee	James T. Brown Authorized representative name	 Signature	8-15-02 Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date

## FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY

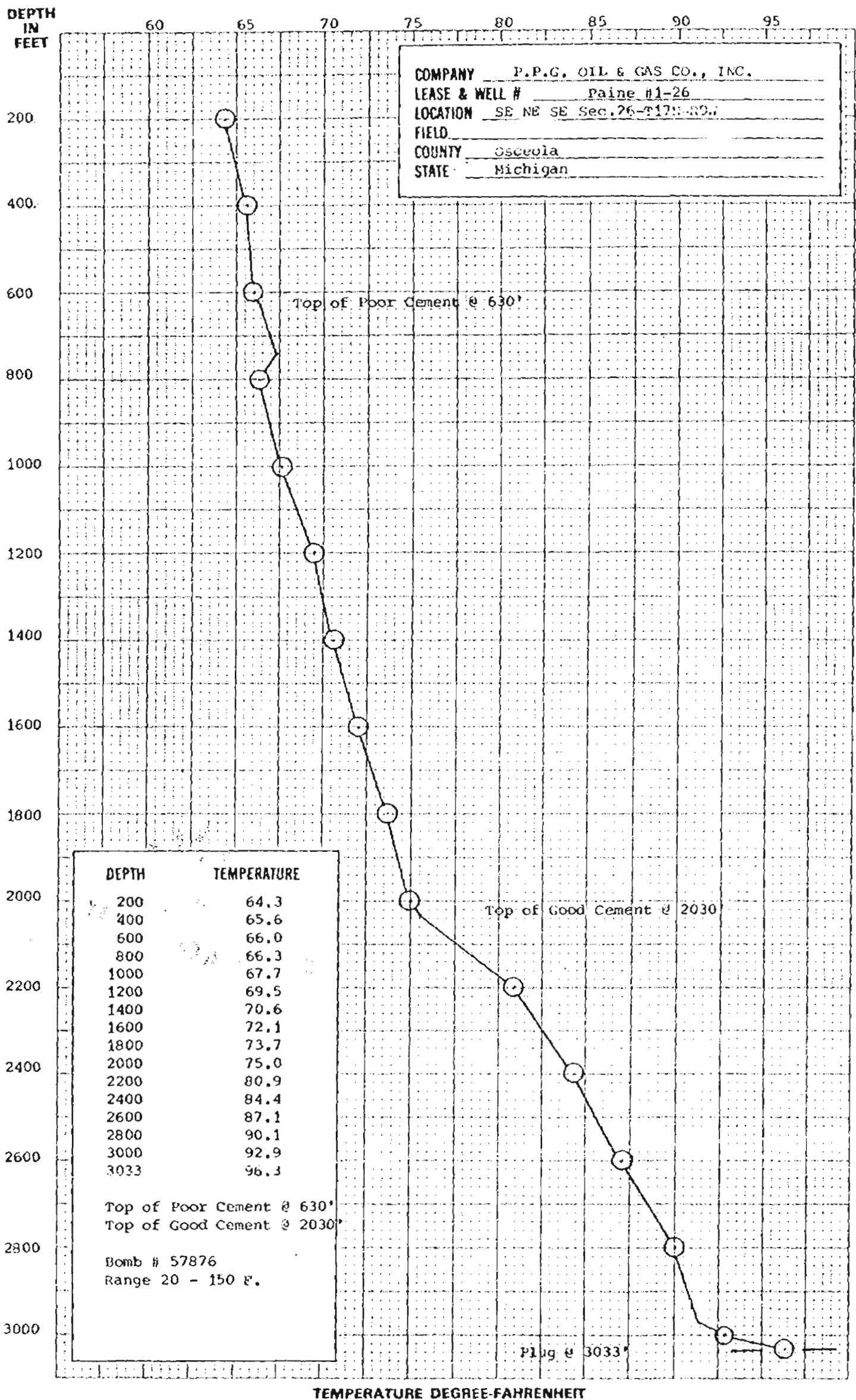
Approved Signature	DEC 19 2002 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner
-----------------------	---------------------	--

## PERMITS &amp; BONDING

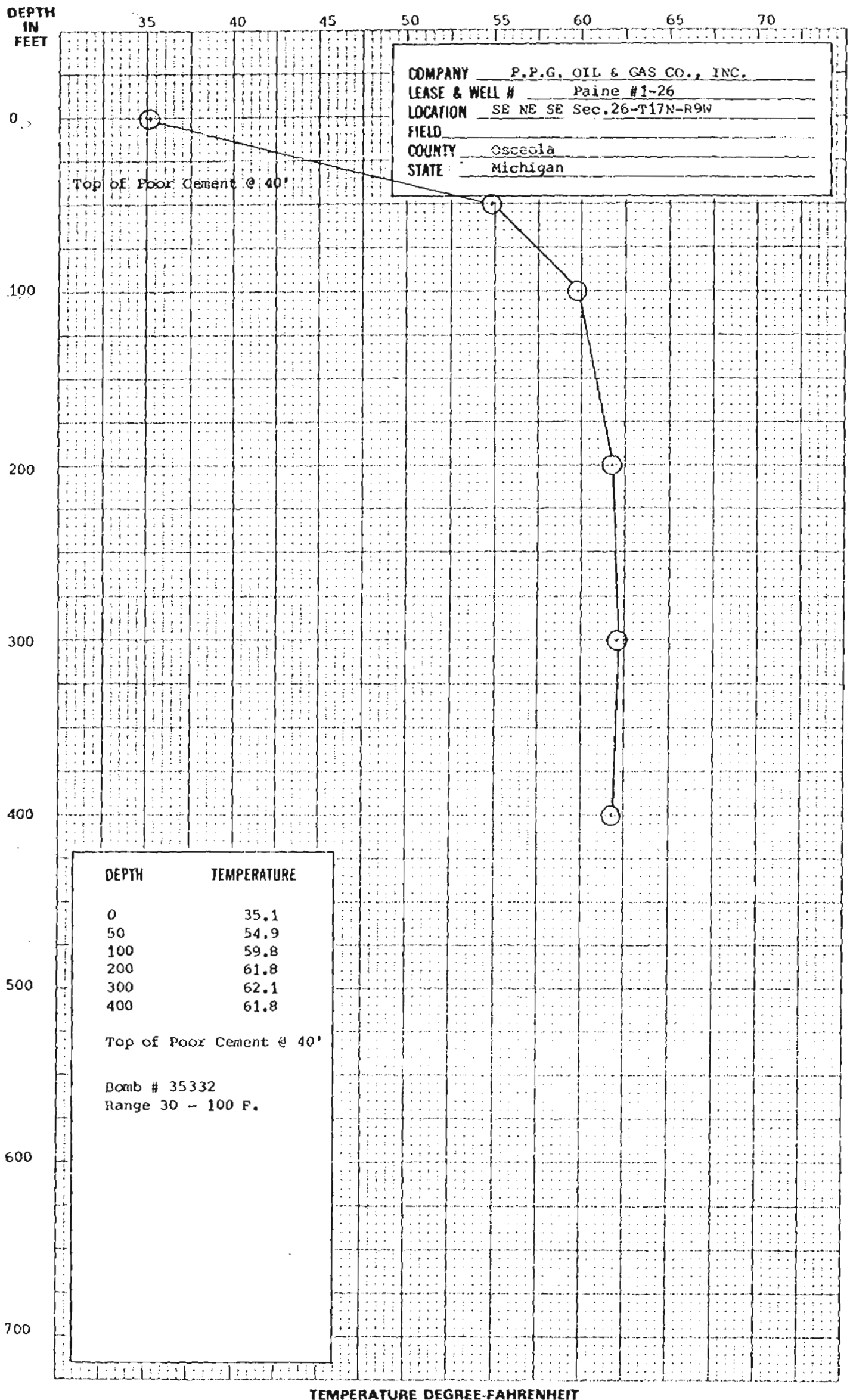
AUG 28 2002

GEOLOGICAL SURVEY

## TEMPERATURE SURVEY



## TEMPERATURE SURVEY





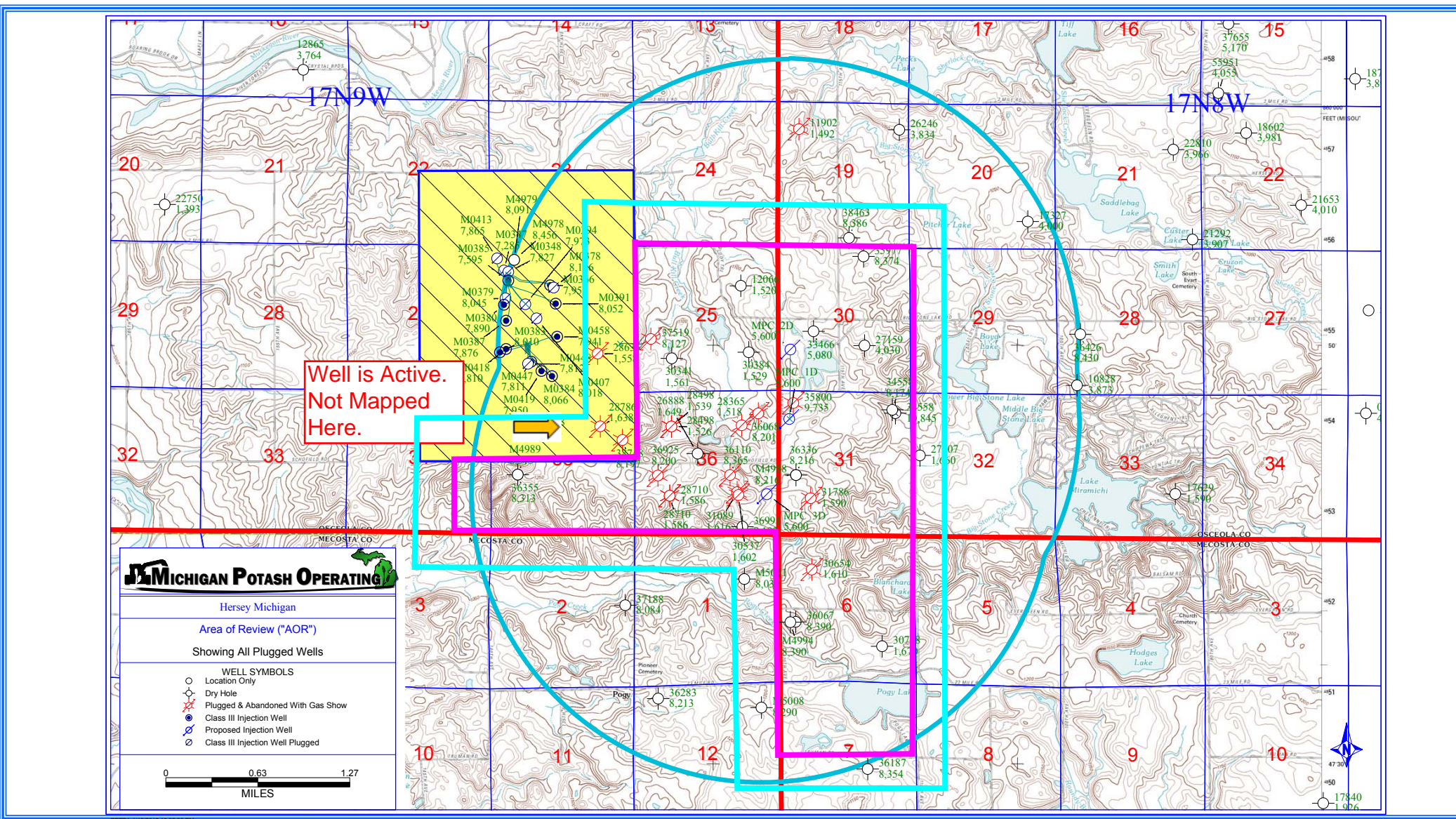
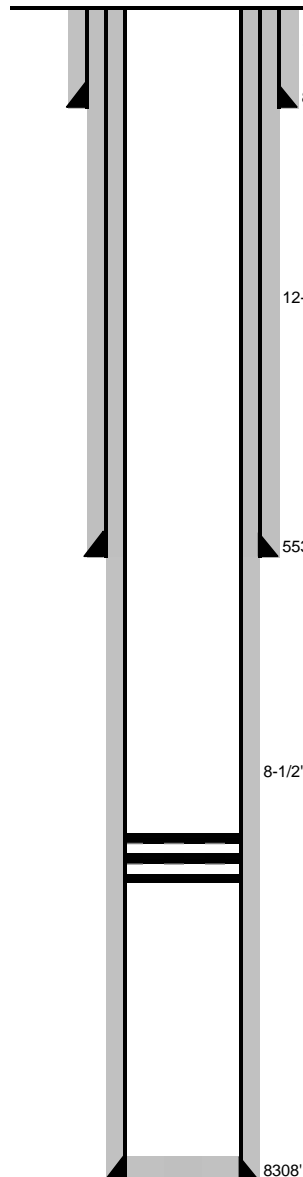


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**Paine 1-35**  
**NE NW NE Sec 35 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

API No. 21-133-36186-0000  
GL @ 1191'  
KB @ 1215'  
WELL COMPLETION DATE: 2/8/83  
PLUGGING COMPLETION DATE:



24" CONDUCTOR DRIVEN TO 56'

17-1/2" Hole

852'

**SURFACE CASING**

13-3/8"; 48#/ft.

SET @ 852' KB

CMT w/575 SX 50/50 POZ + 200 SX CLASS A w/3% CaCl TO SURFACE

12-1/4" Hole

**INTERMEDIATE CASING**

9-5/8"; 40#/ft.

SET @ 5530' KB

CMT w/1295 SX 50/50 POZ + 250 SX CLASS A w/18% SALT TO SURFACE

5530'

8-1/2" Hole

**BURNT BLUFF PERFS**

8077'-8080', 8086'-8089', 8099'-8105'

8115'-8117'

**PROD. CASING**

5-1/2"; 17#/ft.

SET @ 8308' KB

CMT w/800 SX 50/50 POZ 6% GEL, 18% SALT + 300 SX CLASS H

8308'

TD @ 8309' KB

LAST PRODUCING @ 348 MCFD OF GAS/DAY



**Paine 1-35 Well History**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
11/6/1982	SPUD.
12/24/1982	RUSC. MAKE GR RUN TO 8117'. ROH. RU 19' OF 2-1/8" THRU-TUBING PERFORATING GUNS LOADED TO SHOOT 4 SPF. RIH w/PERFORATING GUN. USING CCL, POSITION GUN TO PERFORATE 8086'-89', 8099'-8105'. ONCE AT DEPTH, FIRE GUNS & ROH. RDSC. RETURN WELL TO PRODUCTION.
2/8/1983	WELL COMPLETED. FORMATION AT TD CINCINNATIAN. PRODUCING FM BURNT BLUFF. 24" CONDUCTOR DRIVEN TO 56' 13-3/8" SET AT 858'; 575 SX 50/50 POZ + 200 SX CLASS A w/3% CaCl 9-5/8" SET AT 5525'; 1295 SX 50/50 POZ + 250 SX CLASS A w/18% SALT 5-1/2" SET AT 8308'; 800 SX 50/50 POZ 6% GEL, 18% SALT + 300 SX CLASS H  PERFORATIONS: 8077'-8080', 8086'-8089', 8099'-8105', 8115'-8117'

LAST PRODUCTION/DAY: 348 MCFD OF GAS

FEB 24 1983

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

PERMIT NUMBER

36186

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Willmet, Inc. 2250 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Company 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Paine #1-35						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE NW NE		SECTION 35	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 460 Ft. from North		FOOTAGES (East/West) 852 Ft. from West		COUNTY NAME Osceola			
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		FOOTAGES (East/West)		COUNTY NAME			
Line and		Line and		Line of quarter section			
DRILLING BEGUN 11-6-82		TOTAL DEPTH OF WELL Driller 8309 Log 8307		TYPE WELL Gas Well		ELEVATIONS	
DRILLING COMPLETED 12-21-82		FORMATION AT T.D. Cincinnatian		FT. DRILD. - ROTARY TOOLS From 0 To 8307		K.B. 1215	R.F. 1213
WELL COMPLETED 2-8-83		PRODUCING FORMATION(S) Burnt Bluff		FT. DRILD. - CABLE TOOLS From To		R.T.	Grd. 1191

## CASING, CASING LINERS AND CEMENTING

## PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
24"	56'	D.P.	---				YES	NO
13 3/8"	852'	775 Sx	---	1-15-83	2x/fl	8115 - 8117	XX	
9 5/8"	5530'	2400 Sx	---	1-15-83	2x/ft	8077-80, 86-89,	XX	
5 1/2"	8308'	1100 Sx	---			99-8105		

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)				
Burnt Bluff	Gas	8076	8118				Sam- ples	Odor	Pits	Mud Line	Gas Log
				Reed City Zn	Gas	4150					X
				Sour Zone	Gas	4710					X
				Manitoulin	Gas	8240					X

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (IF U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	500 gal. 28%		None				

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTN	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	XX	Sonic	200 - 8307			3200	1 1/2°			
Birdwell		LDT-CNL	200 - 8307			3800	1 1/2°			
		DLL-MLL	.3300- 8307			5850	1 1/2°			
McCull.	XX	Bond Log				7032	2 1/4°			

## PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
-----	-----	-----	3000	2 Bbls	-----	4702-8097

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
2-21-83	William E. Booker, Geolgoist	<i>William Booker</i>

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE !

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

Filing for change of ownership of well is required in accordance with ☒ Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO 36186	WELL TYPE Gas
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER Paine 1-35	
WELL LOCATION NE 1/4 NW 1/4 NE 1/4 SECTION 35 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil & Gas Co., Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil & Gas Co., Inc., Mr. Donald R. Hall

*Donald R. Hall* 12/14/87

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐ SINGLE WELL

☐ ATTACHED

BONDING CO.

SAFECO Insurance Company of America

☒ BLANKET

☒ ON FILE

BOND NUMBER

5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Mr. David W. Hoopman

*D. W. Hoopman*

12/16/87

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*[Signature]*  
Signature

6/28/88  
Date

DISTRIBUTION BY DNR

- ☒ Lansing
- ☐ Acquiring Owner
- ☐ Selling Owner
- ☐ Field

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☒ CHANGE WELL STATUS ☐ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☒ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION/INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

348 MCFD of Gas

WORK TO BE DONE BY: ☐ APPROVAL MAILED

To be Determined

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT/FT	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
17-1/2"	13-3/8", 48#	858'	575 sx 50/50 Poz/200 sx Class A w/3% CaCl		
12-1/4"	9-5/8", 40#	5525'	1295 sx 50/50 Poz/250 sx Class A w/18% salt		
8-1/2"	5-1/2", 17#	8308'	800 sx 50/50 Poz 6% gel, 18% salt/300 sx		8077-80, 86-89

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

Class "H" 8099-8105  
8115-8117

See Attachment

DETAIL PROPOSED PROCEDURES:

RUSC. Make GR run to 8117'. ROH. RU 19' of 2-1/8" thru-tubing perforating guns loaded to shoot 4 spf. RIH w/perforating gun. Using CCL, position gun to perforate 8086'-89', 8099'-8105'. Once on depth, fire guns & ROH. RDSC. Return well to production.

GEOLOGICAL SURVEY

FEB 28 1992

DNR ADDITIONAL REQUIREMENTS:

Permits & Bonding Unit

NAME/SIGNATURE (Authorized Representative)

N. R. Daniels, Jr., Michigan Production Supt.

APPROVED BY DNR

OFFICE

APPROVAL DATE

DATE

TERMINATION DATE

FEB 10 1992

2/3/92

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.

PR 7200-8

**REQUEST FOR TRANSFER OF PERMIT**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

☒ Part 615 Oil/Gas Well☐ Part 625 Mineral Well

Permit number 36186	Well type Gas	Current true vertical depth 8308
Well name and number Paine #1-35		
Surface location NE 1/4 NW 1/4 NE 1/4 Section 35 T 17N R 9W		
Township Hersey		County Osceola

NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13)

This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.

**TRANSFER OF A PERMIT FROM:**

Name(s) of Selling Permittee(s) Marathon Oil Company		Fed. I.D.# or S.S.# 25-1410539	
Address: Number and Street, City or Town, State, ZIP Code Telephone 7301 NW Expressway Oklahoma City, OK. 73132		(405) 720-7373	
All permits rights and responsibilities are discharged by:			
Marathon Oil Company Permittee	Charles A. Paulson Authorized representative name	 Signature	5/4/00 Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date

**TRANSFER OF A PERMIT TO:**

Name(s) of Acquiring Permittee(s): RSEC, L.L.C.		Fed. I.D.# or S.S.# 84-1533899	
Address: Number and Street, City or Town, State, ZIP Code 1200 17th Street, Suite 2350 Denver, CO 80202		Telephone (303) 892-5616	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <input type="checkbox"/> Blanket <input type="checkbox"/> On File Bond Number Pending Amount _____ <input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
RSEC, L.L.C. Permittee	Steve Swanson, MANAGER Authorized representative name	 Signature	5/4/00 Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date
_____ Permittee	_____ Authorized representative name	_____ Signature	_____ Date

**FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY**

Approved Signature	MAY 31 2001 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner
-----------------------	---------------------	--

## REQUEST FOR TRANSFER OF PERMIT

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994 as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

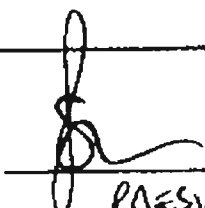
☒ Part 615 Oil/Gas Well

☐ Part 625 Mineral Well

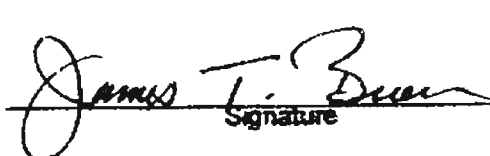
Permit number 36186	Well type Gas	Current true vertical depth 8308
Well name and number Paine #1-35		
Surface location NE 1/4 NW 1/4 NE 1/4 Section 35 T 17N R 9W		
Township Hersey		County Osceola

NOTE: Eligibility for permits is conditioned upon compliance with the statutes, rules and orders of the Department of Environmental Quality. Permits shall not be transferred to persons not in compliance. A permit for a well shall not be transferred if the permittee is under notice because of unsatisfactory conditions at the well site until compliance is achieved. The acquiring permittee shall attach a current Organization Report (EQP 7200-13).  
This permit does not convey property rights in either real estate or material nor does it authorize any injury to private property or invasion of private or public rights nor does it waive the necessity of seeking federal and local permits or complying with other state statutes.

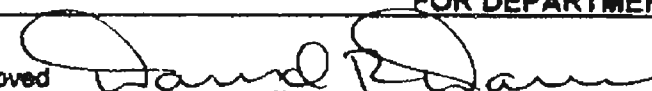
## TRANSFER OF A PERMIT FROM:

Name(s) of Selling Permittee(s) RSEC, L.L.C.		Fed. I.D.# or S.S.# 84-1533899	
Address: Number and Street, City or Town, State, ZIP Code Telephone 1200 17th Street, Suite 2350 Denver, CO 80202		(303) 892-5616	
All permits rights and responsibilities are discharged by:			
RSEC, L.L.C. Permittee	Steve Swanson Authorized representative name	 Signature PRESIDENT	8/5/02 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

## TRANSFER OF A PERMIT TO:

Name(s) of Acquiring Permittee(s): Whiting Petroleum Corporation		Fed. I.D.# or S.S.# 84-0918829	
Address: Number and Street, City or Town, State, ZIP Code 1700 Broadway, Suite 2300 Denver, CO 80290-2300		Telephone (303) 837-1661	
(We are) (I am) an owner or authorized representative of the owner of the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.			
BOND: <input type="checkbox"/> Single Well <input type="checkbox"/> Attached Surety or Bank <u>Travelers Casualty Surety Co.</u>			
<input checked="" type="checkbox"/> Blanket <input checked="" type="checkbox"/> On File Bond Number <u>103847277</u> Amount <u>\$250,000</u>			
<input type="checkbox"/> Statement of Financial Responsibility			
All permittee rights and responsibilities are assumed by:			
Whiting Petroleum Corporation Permittee	James T. Brown Authorized representative name	 Signature	8-15-02 Date
Permittee	Authorized representative name	Signature	Date
Permittee	Authorized representative name	Signature	Date

## FOR DEPARTMENT OF ENVIRONMENTAL QUALITY USE ONLY

Approved  Signature	DEC 19 2002 Date	Distribution by DEQ <input checked="" type="checkbox"/> Lansing <input type="checkbox"/> Selling Owner <input type="checkbox"/> Field <input type="checkbox"/> Acquiring Owner
---	---------------------	--

## PERMITS &amp; BONDING



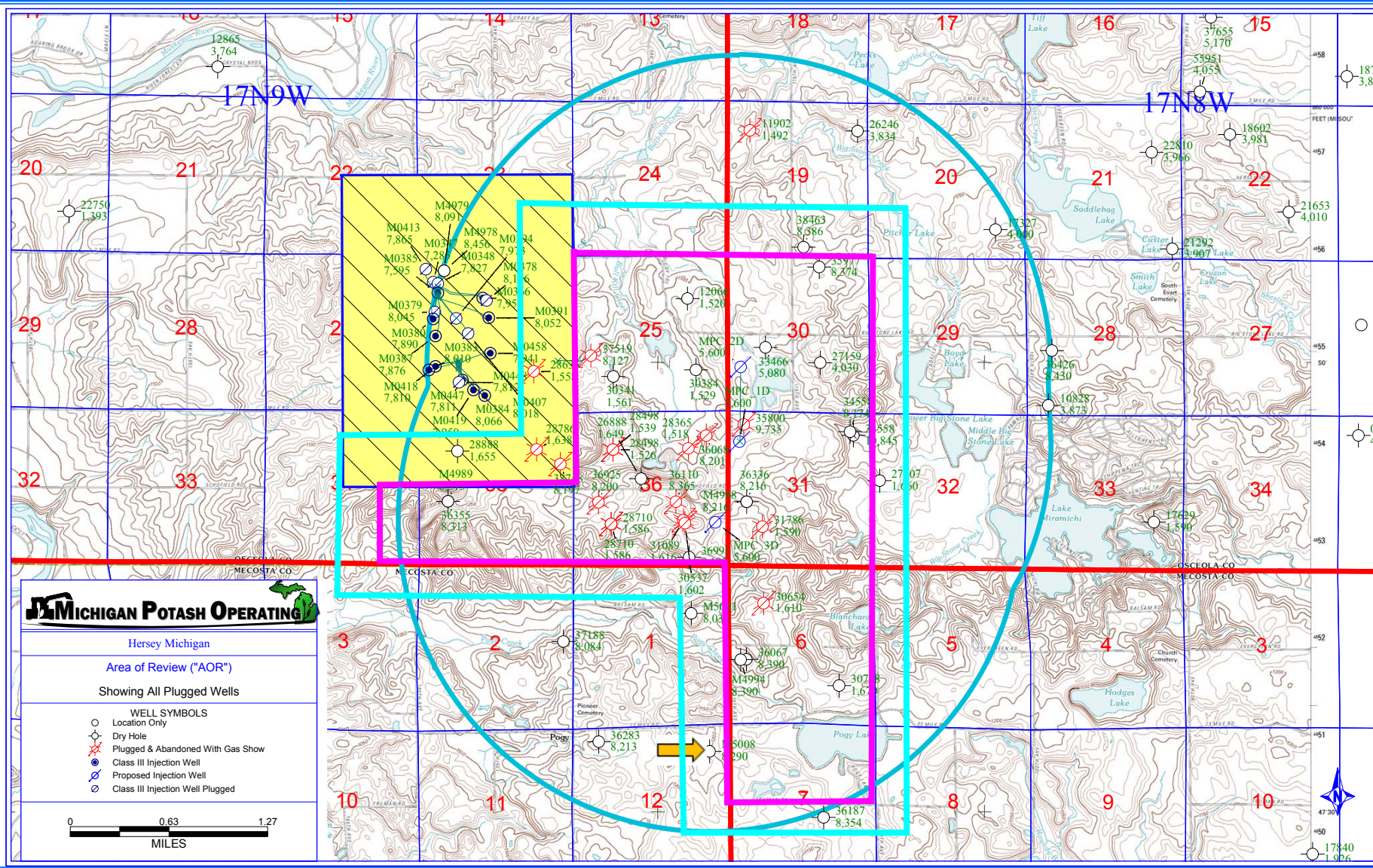
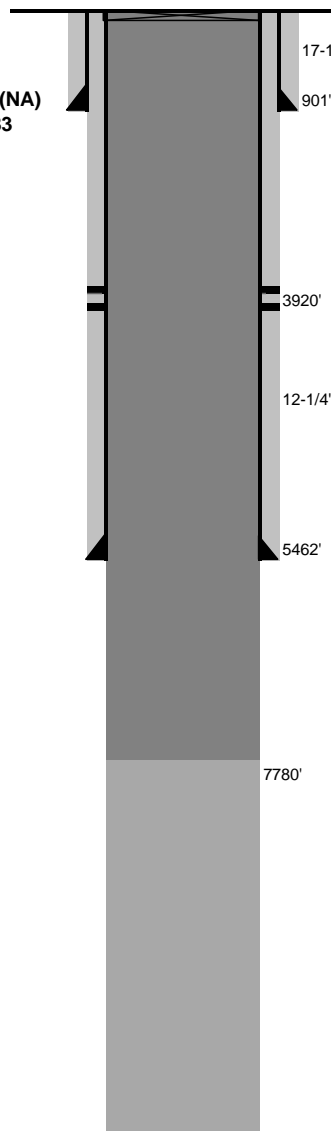


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**PARK 1-12**  
**NE NW NW Sec 12 T16N R9W**  
**MECOSTA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

API No. 21-107-36283-0000  
GL @ 1150.8'  
KB @ 1167.1'  
WELL COMPLETION DATE: DRY HOLE (NA)  
PLUGGING COMPLETION DATE: 6/20/83



**UPDATED APRIL 2014 BY JLT**

24" CONDUCTOR DRIVEN TO 61'

17-1/2" Hole expected

**SURFACE CASING**

13 3/8", 48#/ft

SET @ 901' KB

CMT w/ 700 SX POZ + 200 SX CLASS A TO SURFACE

**PER TEMP SURVEY**

TOC @ 4040'

PLUG @ 5345'

12-1/4" Hole expected

**INTERMEDIATE CASING**

9 5/8", 40#/ft

SET @ 5462' KB

CMT w/ 1300 SX TO SURFACE

**BP @ 5400'**

**PROD. CASING**

NA

RAN DRILL PIPE TO 8200', SPOTTED 150 SX CL A.

TOC 7780'

PULLED DRILL PIPE AND RERAN WITH BP TO 5400'

SET BP.

TEMPORARILY ABANDONED

PERFORATED 9-5/8" @ 3920' AND CIRCULATED 9-5/8" AND

SQUEEZED w/100 SX 50-50 POZ + 200 SX CL A

SHUT IN FOR CMT TO SET. TIH AND MILLED OUT

MECHANICAL BP SET @ 5400'.

SET CMT PLUGS FROM 7700' TO SURFACE w/ 1200 SX 50-50 POZ +  
25 SX CL A AT SURFACE, CUT AND CAPPED.

**TD @ 8215' KB**



**PARK 1-12 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
12/10/1982 1/9/1983	SPUD. DRILLING COMPLETED. FORMATION AT TD CINCINNATIAN. 24" CONDUCTOR SET AT 61' 13 3/8" SET AT 901'; 700 SX POZ + 200 SX CL A 9 5/8" SET AT 5462'; 1300 SX
1/10/1983	PLUGGING START DATE RAN DRILL PIPE TO 8200' AND SPOTTED 150 SX CL A. TOP OF CEMENT 7780'. PULLED DRILL PIPE AND RERAN WITH  PERFORATED 9-5/8" AT 3920' AND CIRCULATED 9-5/8" AND SQUEEZED WITH 100 SX 50-50 POZ AND 200 SX CL A. SHUT IN FOR CEMENT TO SET. TRIPPED IN HOLE AND MILLED OUT MECHANICAL BP SET AT 5400'. SET CEMENT PLUGS FROM 7700' TO SURFACE - 1200 SX 50-50 POZ AND 25 SX CL A AT SURFACE, CUT AND CAPPED.
6/20/1983	PLUGGING COMPLETED.  PER TEMPERATURE SURVEY: TOP OF CEMENT AT 4040' AND PLUG AT 5345'

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

FEB 10 1983

PERMIT NUMBER

36283

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT

Willmet, Inc.  
2250 Enterprise Drive  
Mt. Pleasant, MI 48858

NAME & ADDRESS OF DRILLING CONTRACTOR(S)

T. D. Provins  
2113 Enterprise Drive  
Mt. Pleasant, MI 48858

LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT

Park #1-12

DIRECTIONALLY DRILLED

YES ☐ NO ☒

SURFACE LOCATION

NE NW NW

SECTION

12

TOWNSHIP

16N

RANGE

9W

TOWNSHIP NAME

Grant

FOOTAGES (North/South)

460 Ft. from North Line and 880 Ft. from West Line of quarter section

(East/West)

COUNTY NAME

Mecosta

SUBSURFACE LOCATION

SECTION

TOWNSHIP

RANGE

TOWNSHIP NAME

FOOTAGES (North/South)

(East/West)

COUNTY NAME

DRILLING BEGUN

12-10-82

TOTAL DEPTH OF WELL

Driller 8215 Log 8213

TYPE WELL

Dry Hole

ELEVATIONS

DRILLING COMPLETED

1-9-83

FORMATION AT T.D.

Cincinnatian

FT. DRILD. - ROTARY TOOLS

From 0 To 8215

K.B.

1167.1

R.F.

1165.9

WELL COMPLETED

PRODUCING FORMATION(S)

NONE

FT. DRILD. - CABLE TOOLS

From To

R.T.

Grd.

1150.8

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
							YES	NO
24"	61'							
13 3/8"	901'	700 POZ/200 C1 A						
9 5/8"	5462'	1300 Sx				NONE		

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
							Sam- ples	Odor	Pits	Mud Line	Gas Log.	Fill Up
NONE				Antrim	Gas	3100				XX		
				RC Dol	Gas	4100				XX		
				Blk Lm	Gas	5150				XX		

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	NONE		NONE				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	XX	LDT-CNL-GR	100-8209			3185	1/2°			
Birdwell		Sonic	700-8200			4995	2°			
		DLL-MLL	3300-8200			5826	3/4°			
						7954	2 1/2°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
1-20-83	William E. Booker, Geologist	William E. Booker

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

**FINAL APPROVAL**

FEB 16 1983

FEB 11 1983

NOV 28 1983

MISSING HAS COPY

PERMIT NUMBER  
36283

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER WILLMET, INC.			
COMPLETE LEASE OR FARM NAME(S) Park			WELL NUMBER #1-12
WELL LOCATION NW ¼ NW ¼ NW ¼ SEC. 12 T. 16N R. 9W		TOWNSHIP Grant	COUNTY Mecosta
TYPE OF WELL (Oil, Gas, Dry Hole, etc.) Dry Hole		TOTAL DEPTH 8215	FORMATION Cincinnatian
DATE PLUGGING STARTED 1-10-83	DATE PLUGGING COMPLETED 1-10-83	DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING Skipper	

CASING RECORD			
SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	61'		
13 3/8"	901'		
9 5/8"	5462'		

BRIDGES OR PLUGS		
TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	8200-7780	150 Sx Cl A
Mechanical		
Bridge Plug	5400	

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, give details:
Did a Service Company pump mud, spot cement, or set bridge plugs?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	If yes, give name and address: Dowell
Was the well plugged by a Company or Contractor other than Owner or Operator?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, give name and address:
Representatives of Owner, Operator, Company, or Contractor who witnessed plugging: Marvin Woods		

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED Ran drill pipe to 8200 and spotted 150 sx Cl A. Top of cement 7780. Pulled drill pipe and reran with bridge plug to 5400, set bridge plug. TEMPORARILY ABANDONED.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION		
"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."		
NAME AND TITLE (Typed or Printed) William E. Booker, Geologist	COMPANY NAME AND ADDRESS Strickler Geological Services, Inc. 1425 S. Mission Mt. Pleasant, MI 48858	
SIGNATURE <i>William E. Booker</i>	DATE (Month, Day, Year) 1-20-83	

## OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

**Supplemental Plugging Data and Site Conditions:**

Site clean & recontoured

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

**SIGNATURE**

## DIVISION

DATE \_\_\_\_\_

James G. Skipper

## Geological Survey

11-21-83

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

MAY 22 1984 MAY 24 1984 LANSING HAS COPY

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER  
36283

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc., 2258 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

Park

WELL NUMBER

#1-12

WELL LOCATION

NE ¼ NW ¼ NW ¼ SEC. 12 T. 16N R. 9W

TOWNSHIP

Grant

COUNTY

Mecosta

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole

TOTAL DEPTH

8215

FORMATION

Cincinnatian

DATE PLUGGING STARTED

1-10-83

DATE PLUGGING COMPLETED

6-20-83

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Skipper

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	61	-----	
13 3/8"	901	-----	
9 5/8"	5462	-----	

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	8200-7780	150 Sx Cl A
Cement	7700-0	1225 Sx

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Marvin Woods

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Perforated 9 5/8" at 3920' and circulated 9 5/8" and squeezed with 100 sx 50-50 poz and 200 sx Cl A. Shut in for cement to set. Tripped in hole and milled out mechanical B.P. set at 5400'. Set cement plugs from 7700' to surface - 1200 sx 50-50 poz and 25 sx Cl A at surface, cut and capped.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William E. Booker, Geologist

COMPANY NAME AND ADDRESS

STRICKLER GEOLOGICAL SERVICES, INC.  
1425 S. Mission  
Mt. Pleasant, MI 48858

SIGNATURE

*William E. Booker*

DATE (Month, Day, Year)

5/17/84

## OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

**DEPARTMENT USE ONLY****Supplemental Plugging Data and Site Conditions:**

~~9/24/78 Re: Dept. sent in the 442 spec but received~~

Location approved by Skipper 2/23/84 Clean & recontoured

## FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

**SIGNATURE**

#### DIVISION

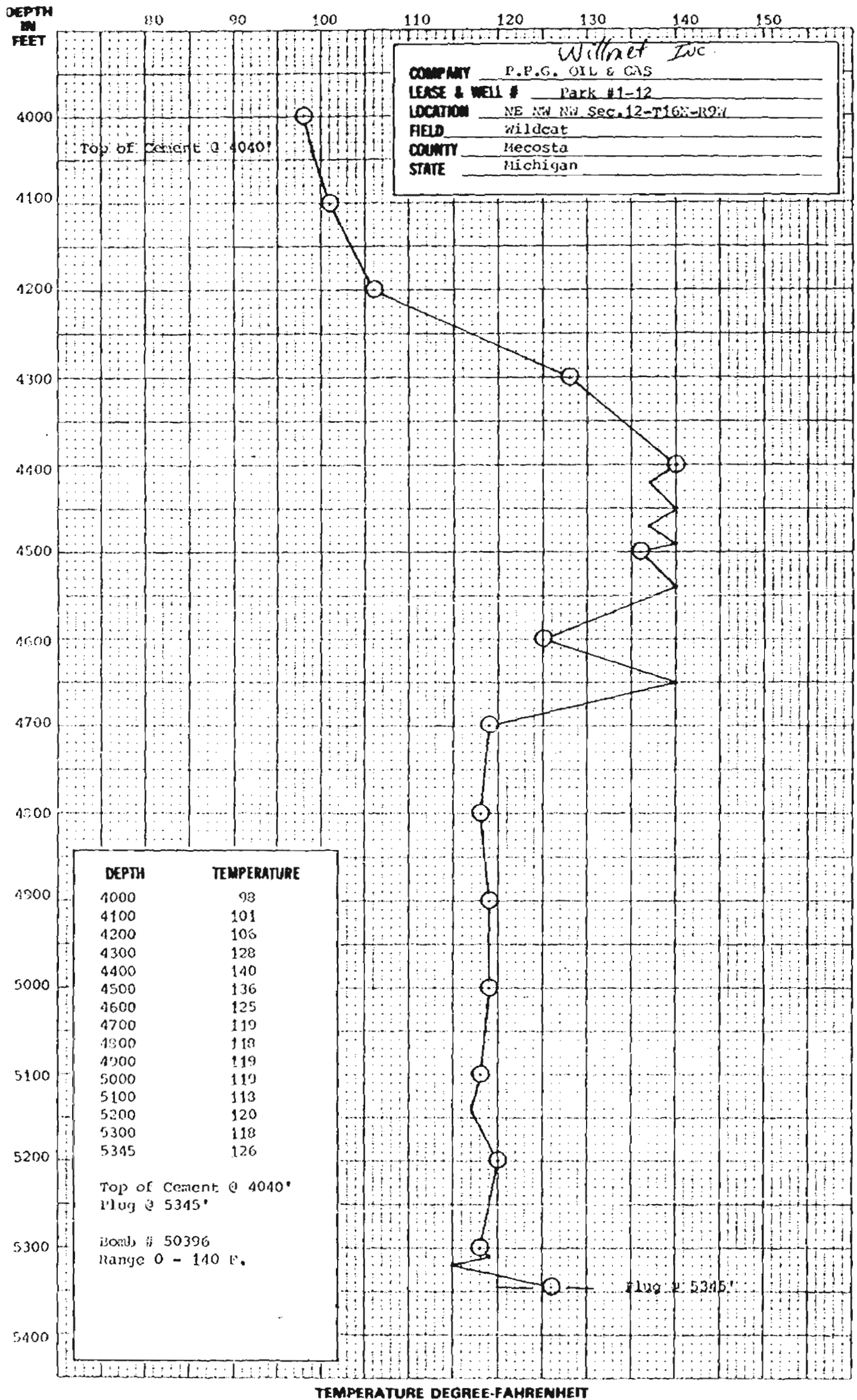
DATE \_\_\_\_\_

James G. Skipper

Geol. Survey

9/26/84

## TEMPERATURE SURVEY





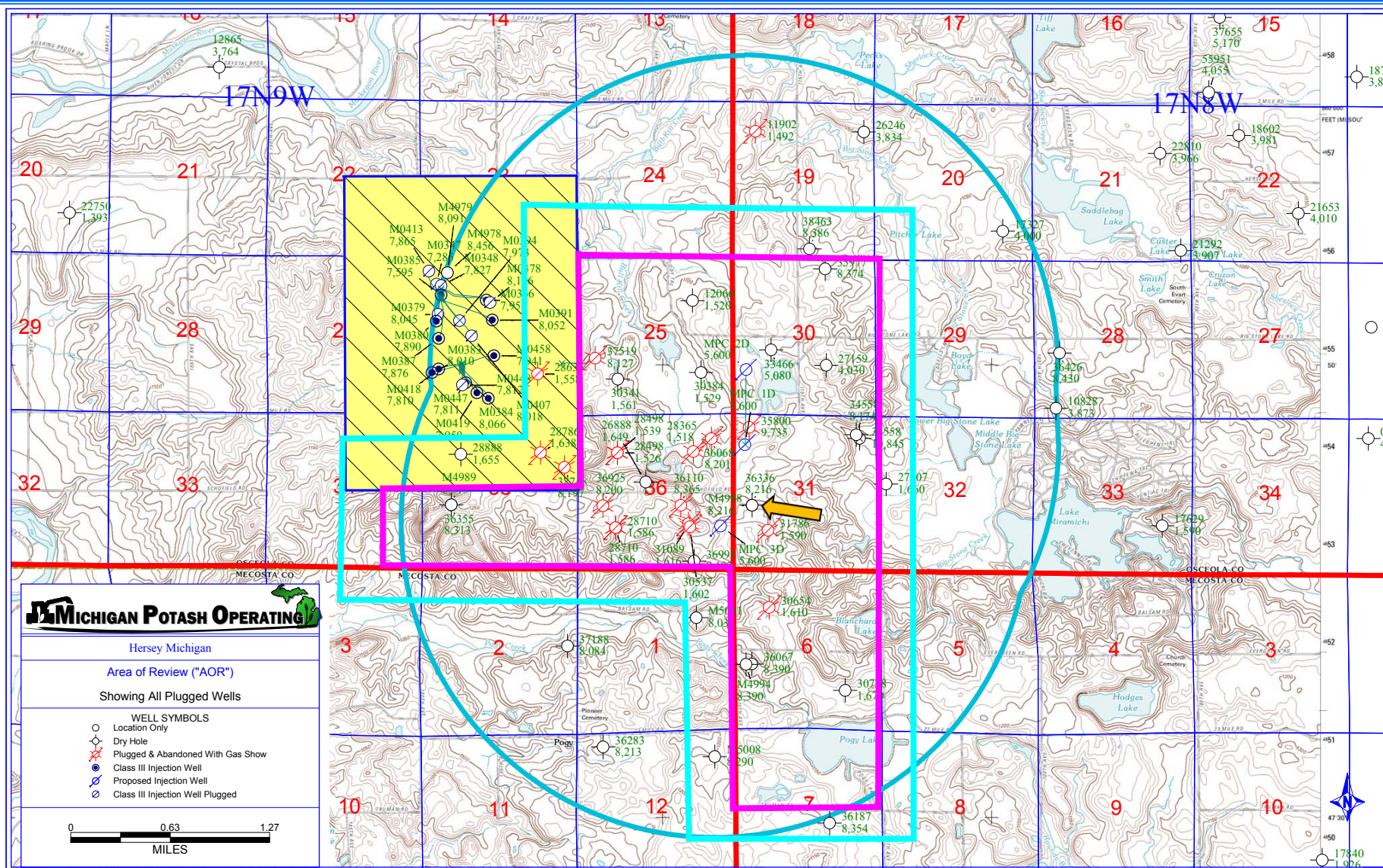


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.



**PARK 1-31**  
**NE NW SW Sec 31 T17N R8W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

**UPDATED APRIL 2014 BY JLT**

20" CONDUCTOR DRIVE TO 72'

14-3/4" Hole expected

**SURFACE CASING**

11-3/4"; 48#/ft.

SET @ 912' KB

CMT w/500 SX TO SURFACE

10-5/8" Hole expected

**INTERMEDIATE CASING**

8-5/8"; 60#/ft.

SET @ 5494' KB

CMT w/ 1250 SX TO SURFACE

**PROD. CASING**

NA

**PLUGGING**

RAN DRILL PIPE TO 8216', SPOTTED 90 SX CMT

PULLED DP TO 7900', SPOTTED 51 SX

PULLED DP TO 7600', SPOTTED 85 SX

PULLED DP TO 7300', SPOTTED 309 SX

PULLED DP TO 5500', SPOTTED 87 SX

PULLED DP TO 5200', SPOTTED 226 SX

PULLED DP TO 3900', SPOTTED 226 SX

CUT AND CAPPED.

API No. 21-133-36336-0000

GL @ 1168.9'

KB @ 1184.8'

WELL COMPLETION DATE: DRY HOLE (NA)

PLUGGING COMPLETION DATE: 2/12/84

TD @ 8216' KB

**PARK 1-31 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
1/10/1984	SPUD.
2/10/1984	DRILLING COMPLETED. FORMATION AT TD BURNT BLUFF. 20" CONDUCTOR DRIVEN TO 72' 11-3/4" SET AT 912'; 580 SX 8-5/8" SET AT 5494'; 1250 SX
2/11/1984	PLUGGING STARTED RAN DRILL PIPE TO 8216' AND SPOTTED 90 SX, PULLED DRILL PIPE TO 7900' AND SPOTTED 51 SX PULLED DRILL PIPE TO 7600' AND SPOTTED 85 SX PULLED DRILL PIPE TO 7300' AND SPOTTED 309 SX PULLED DRILL PIPE TO 5500' AND SPOTTED 87 SX PULLED DRILL PIPE TO 5200' AND SPOTTED 226 SX PULLED DRILL PIPE TO 3900' AND SPOTTED 226 SX CUT AND CAPPED.
2/12/1984	PLUGGING COMPLETION DATE

DEPARTMENT OF NATURAL RESOURCES  
LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)  
Submit in DUPLICATE Within 30 Days after Well Completion

SEP 06 1984

PERMIT NUMBER 36336  
DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG Oil & Gas Co., Inc. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Co. 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Park 1-31						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE NW SW		SECTION 31	TOWNSHIP 17N	RANGE 8W	TOWNSHIP NAME Evart		
FOOTAGES (North/South) 460 Ft. from North		Line and 460		(East/West) Ft. from West		Line of quarter section	
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	COUNTY NAME Osceola		
FOOTAGES (North/South)		Line and		(East/West) Ft. from		Line of quarter section	
DRILLING BEGUN 1-10-84		TOTAL DEPTH OF WELL Driller 8216 Log 8216		TYPE WELL Dry Hole		ELEVATIONS	
DRILLING COMPLETED 2-10-84		FORMATION AT T.D. Burnt Bluff		FT. DRLD. - ROTARY TOOLS From 0 To 8216		K.B. 1184.8	R.F. 1183.3
WELL COMPLETED		PRODUCING FORMATION(S)		FT. DRLD. - CABLE TOOLS From To		R.T.	Grd. 1168.9

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
20"	72'	Drill Pipe	---				YES	NO
11 3/4"	912'	580 Sx	---					
9 5/8"	5494'	1250 Sx	---					

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
							Sam- ples	Odor	Pas	Mud Line	Gas Log	Fat Up
				Sunbury	Gas	2650					XX	
				Antrim	Gas	3150					XX	
				Burnt Bluff	Gas	8159					XX	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTN	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	XX	BHC Sonic	6610-8216			2545	1°			
Birdwell		DLL MLL	3300-5503			3500	1/2°			
			6610-8216			6666	3/4°			
		LDT CNL GR	200-8216			7537	1/2°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 3/19/84	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E. Booker</i>
-----------------	--	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO:

Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

Filing for change of ownership of well is required in accordance with ☒ Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO 36336	WELL TYPE Dry Hole
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER Park 1-31	
WELL LOCATION NE 1/4 NW 1/4 SW 1/4 SECTION 31 T 17N R 8W	
TOWNSHIP Evart	COUNTY Osceola

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil & Gas Co., Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by:

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil & Gas Co., Inc., Richard M. Rompala

*Richard M. Rompala* 3/3/88

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐ SINGLE WELL

☐ ATTACHED

BONDING CO.

SAFECO Insurance Company of America

☒ BLANKET

☒ ON FILE

BOND NUMBER

5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Donald R. Hall

*Donald R. Hall* 3/28/88

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*[Signature]*

Signature

6/28/88

Date

DISTRIBUTION BY DNR

☒ Lansing

☐ Acquiring Owner

☐ Selling Owner

☐ Field

PERMIT DISTRIBUTION  
Permittee -- Orig & 1 copy  
Division Office -- 2 copies  
Field Office -- File copy  
Others -- On request

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

PERMIT TO PLUG AND ABANDON

PERMIT NUMBER  
36336

FIELD NAME  
Hersey

NAME AND ADDRESS OF PERMITTEE

PPG

WELL NAME AND WELL NO.

Park #1-31

LOCATION (1/4 1/4 1/4 or other)

NE NW SW,

SECTION

31

T 17N R 8W

TOWNSHIP

Evart

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry hole

DATE COMPLETED

2/9/84

DATE PLUGGING WILL START

2/10/84

PLUGGING PERMIT REQUESTED BY & DATE

W. Booker 2/10/84

TEST PRODUCTION

WPD

BWPD

MCFGPD

DATE

PLUGGING TO BE DONE BY

Provins #12

PERMIT MAILED TO

COPIES MAILED TO

CASING AND CEMENTING RECORD

WELL DIA.	CASING DIA. & WT./FT.	DEPTH SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP.	PERFORATIONS
	20"	72'			
	113/4"	912'	580 sx	surf	
	85/8"	5494'	1250 sx	"	

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

CONFIDENTIAL.

PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

Spot Cl A cmt 8216-7900';  
spot lite cmt. 7900-7600';  
spot Cl A cmt 7600-7300';  
spot lite cmt 7300-5500';  
spot Cl A cmt 5500-5200';  
spot lite cmt. 5200-surface.

NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 186 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

Michael J. Moss

OFFICE

Cadillac n#6

DATE

2/13/84

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPPLICATE within 30 days after completion.

R-7229  
Rev. 11/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

SEP 06 1984 CADILLAC HAS COPY  
PERMIT NUMBER 36336  
FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER PPG Oil & Gas Co., Inc., 2258 Enterprise Drive, Mt. Pleasant, MI 48858			
COMPLETE LEASE OR FARM NAME(S) Park			WELL NUMBER 1-31
WELL LOCATION NE ¼ NW ¼ SW ¼ SEC. 31 T. 17N R. 8W	TOWNSHIP Evart	COUNTY Osceola	
TYPE OF WELL (Oil, Gas, Dry Hole, etc.) Dry Hole	TOTAL DEPTH 8216	FORMATION Burnt Bluff	
DATE PLUGGING STARTED 2-11-84	DATE PLUGGING COMPLETED 2-12-84	DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING Mike Moss	

CASING RECORD			
SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
20"	72'	-----	-----
11 3/4"	912'	-----	-----
8 5/8"	5494	-----	-----

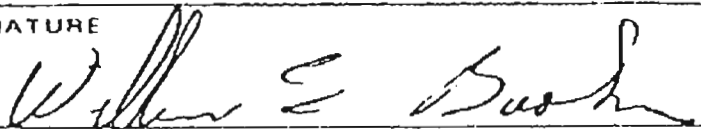
BRIDGES OR PLUGS		
TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	8216	90 Sx
Cement	7900	51 Sx
Cement	7600	85 Sx
Cement	7300	309 Sx
Cement	5500	87 Sx
Cement	5200	226 Sx
Cement	3900	226 Sx

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, give details:
Did a Service Company pump mud, spot cement, or set bridge plugs?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	If yes, give name and address: Halliburton
Was the well plugged by a Company or Contractor other than Owner or Operator?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, give name and address:
Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:	Carl Cookingham	

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Ran drill pipe to 8216 and spotted 90 sx, pulled drill pipe to 7900 and spotted 51 sx, pulled drill pipe to 7600 and spotted 85 sx, pulled drill pipe to 7300 and spotted 309 sx, pulled drill pipe to 5500 and spotted 87 sx, pulled drill pipe to 5200 and spotted 226 sx, pulled drill pipe to 3900 and spotted 226 sx. Cut and capped.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION		
"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."		
NAME AND TITLE (Typed or Printed) William E. Booker, Geologist	DATE (Month, Day, Year) 3-19-84	COMPANY NAME AND ADDRESS STRICKLER GEOLOGICAL SERVICES, INC. 1425 S. Mission Mt. Pleasant, MI 48858
SIGNATURE 		



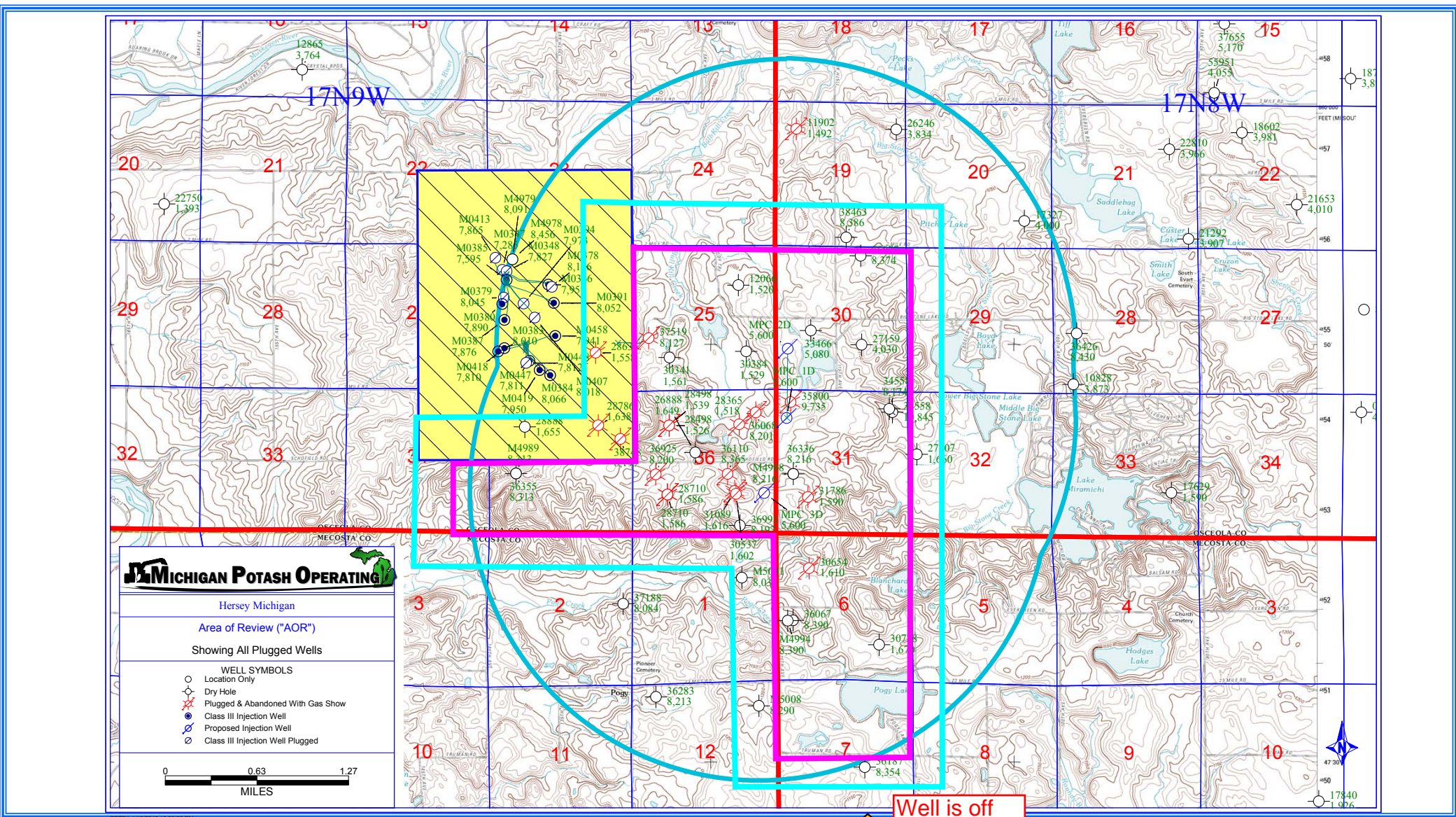


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) Michigan Stray wells that do not penetrate the injection or confining horizon. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**MICHIGAN POTASH OPERATING, LLC**

**STEIN 1-18**  
NE NE SE Sec 18 T16N R8W  
MECOSTA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

20" CONDUCTOR DRIVEN TO 62'

API No. 21-107-36890-0000

GL @ 1148.6'

KB @ 1158.2'

WELL COMPLETION DATE: DRY HOLE (NA)

PLUGGING COMPLETION DATE: 8/27/83

17-1/2" Hole expected

**SURFACE CASING**

13 3/8", 48#/ft

SET @ 810' KB

CMT w/700 SX TO SURFACE

810'

12-1/4" Hole expected

**INTERMEDIATE CASING**

9 5/8", 40#/ft

SET @ 5440' KB

CMT w/1165 SX TO SURFACE

5440'

**PROD. CASING**

NA

**PLUGGING**

RAN IN OPEN ENDED DRILL PIPE AND

SPOTTED 140 SX CLASS A FROM 8264'-7850'.

PULLED UP TO 7850' AND SPOTTED 440 SX Hic TO 5650'

PULLED UP TO 5650' AND SPOTTED 140 SX CLASS A TO 5250'

PULLED UP TO 5250' AND SPOTTED 1040 SX Hic TO 500'

PULLED UP TO 500' AND SPOTTED 180 SX CLASS A TO SURFACE

CUT AND CAPPED 3' BELOW GROUND

TD @ 8264' KB



**STEIN 1-18 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
8/3/1983	SPUD.
8/25/1983	DRILLING COMPLETED. FORMATION AT TD CINCINNATIAN. 20" CONDUCTOR SET AT 62' 13 3/8" SET AT 810'; 700 SX 9 5/8" SET AT 5440'; 1165 SX
8/26/1983	PLUGGING START DATE RAN IN OPEN ENDED DRILL PIPE AND SPOTTED 140 SX CL A FROM 8264'-7850'; PULLED UP TO 7850' AND SPOTTED 440 SX H/c TO 5650'; PULLED UP TO 5650' AND SPOTTED 140 SX CL A TO 5250'; PULLED UP TO 5250' AND SPOTTEED 1040 SX H/c TO 500'; PULLED UP TO 500' AND SPOTTED 180 SX CL A TO SURFACE; CUT AND CAPPED 3' BELOW GROUND.
8/27/1983	PLUGGING COMPLETED.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

NOV 23 1983

PERMIT NUMBER

36,890

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG Oil & Gas, Inc. 2250 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) James Bigard Drilling Company 1315 South Mission Road Mt. Pleasant, MT 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT STEIN #1-18						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE 1/4 NE 1/4 SE 1/4		SECTION 18		TOWNSHIP 16N		RANGE 8W	
FOOTAGES (North/South) 465 Ft. from north		Line and 635		FOOTAGES (East/West) Ft. from east		Line of quarter section	
SUBSURFACE LOCATION		SECTION		TOWNSHIP		RANGE	
FOOTAGES (North/South)		Line and		FOOTAGES (East/West)		Line of quarter section	
TOWNSHIP NAME Chippewa		COUNTY NAME Mecosta		TOWNSHIP NAME		COUNTY NAME	
DRILLING BEGUN 8/3/83		TOTAL DEPTH OF WELL Driller 8264 Log 8223		TYPE WELL Dry Hole		ELEVATIONS	
DRILLING COMPLETED 8/25/83		FORMATION AT T.D. Cincinnatian		FT. DRLD. - ROTARY TOOLS From 0 To 8264		K.B. 1158.2 R.F. 1156.9	
WELL COMPLETED		PRODUCING FORMATION(S) None		FT. DRLD. - CABLE TOOLS From To		R.T. Grd. 1148.6	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
20"	62'	D.P.					YES	NO
13-3/8"	810'	700 sx	-0-			None		
9-5/8"	5440'	1165 sx	-0-					

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
None							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Sunbury	Gas						X	
				Antrim	Gas						X	
				Burnt Bluff	Gas	8160					X	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	None		None				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	5440-8264			1515	3/4			
Birdwell		DLL-MLL	5440-8264			3500	1/2			
		Sonic	5440-8264			4600	3/4			
Gearhardt	X	CNL-Density	800-5440			8240	1 1/2			
		Sonic	800-5440							

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 8/29/83	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E. Booker</i>
-----------------	--	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

# FORMATION RECORD

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

ELEVATION USED:		GEOLOGIST NAME:		TOPS TAKEN FROM:	
				<input type="checkbox"/> DRILLERS LOG <input type="checkbox"/> SAMPLE LOG <input type="checkbox"/> ELECTRIC LOG	

FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)	FROM	TO	FORMATION (TYPE, COLOR, HARDNESS)
NOTE: IF WELL DIRECTIONALLY DRILLED, ADD TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE.			6302		E Unit
1410		Triple Gyp	6429		D Salt
1484		Brown Limestone	6468		C Shale
1592		Stray	6562		B Salt
1706		Marshall	6940		A-2 Carbonate
1860		Coldwater Shale	7079		A-2 Evaporite
2630		Sunbury	7443		A-1 Carbonate
2744		Ellsworth	7496		A-1 Evaporite
3117		Antrim	7856		Niagaran
3280		Traverse Formation	7974		Manistique (Clinton)
3332		Traverse Limestone	8036		Burnt Bluff
3842		Bell Shale	8094		Cabot Head
3900		Dundee	8174		Manitoulin
3964		Reed City Anhydrite	8212		Cincinnatian
3990		Reed City Dolomite			
4124		Detroit River Anhydrite			
4190		Detroit River Salt			
4558		Base Detroit River Salt			
4588		Sour Zone			
4758		Massive Anhydrite			
4951		Base of Anhydrite			
5052		Black Lime			
5128		Sylvania			
5250		Bois Blanc			
5370		Bass Island			
5691		Salina G Unit			
5702		F Unit			
5747		F Salt			

IF WELL WAS CORED, ATTACH CORE DESCRIPTION
DRILL STEM TEST DATA
No DST or cores

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

NOV 23 1983

LANSING HAS COPY

WELL PLUGGING RECORD

NOV 29 1983

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER

36,890

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

PPG Oil & Gas, Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

STEIN

WELL NUMBER

1-18

WELL LOCATION

NE 1/4 NE 1/4 SE 1/4 SEC. 18 T. 16N R. 8W

TOWNSHIP

Chippewa

COUNTY

Mecosta

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry hole

TOTAL DEPTH

8264

FORMATION

Cincinnatian

DATE PLUGGING STARTED

8/26/83

DATE PLUGGING COMPLETED

8/27/83

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Wayne Todd

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
20"	62'	-0-	
13-3/8"	810'	-0-	
9-5/8"	5440'		

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	8264	140 sx Cl A
"	7850	440 sx Hlc
"	5650	140 sx Cl A
"	5250	1040 sx Hlc
"	500	180 sx Cl A

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging: Willy Masterson

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED Ran in open ended drill pipe and spotted 140 sx from 8264-7850'; pulled up to 7850' and spotted 440 sx to 5650'; pulled up to 5650' and spotted 140 sx to 5250'; pulled up to 5250' and spotted 1040 sx to 500'; pulled up to 500' and spotted 180 sx to surface; cut and capped 3' below ground.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William E. Booker, Geologist

SIGNATURE

William E. Booker

DATE (Month, Day, Year)

8/29/83

COMPANY NAME AND ADDRESS

STRICKLER GEOLOGICAL SERVICES, INC.  
1425 South Mission Road  
Mt. Pleasant, MI 48858

# OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

Supplemental Plugging Data and Site Conditions:

Location approved by skipper 7/23/84 Clean & recontoured.

**GEOLOGICAL SURVEY**

NOV 23 1983

FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

SIGNATURE	DIVISION	DATE
James L. Skipper Regulatory Control Unit	Geol. Survey	9/26/84



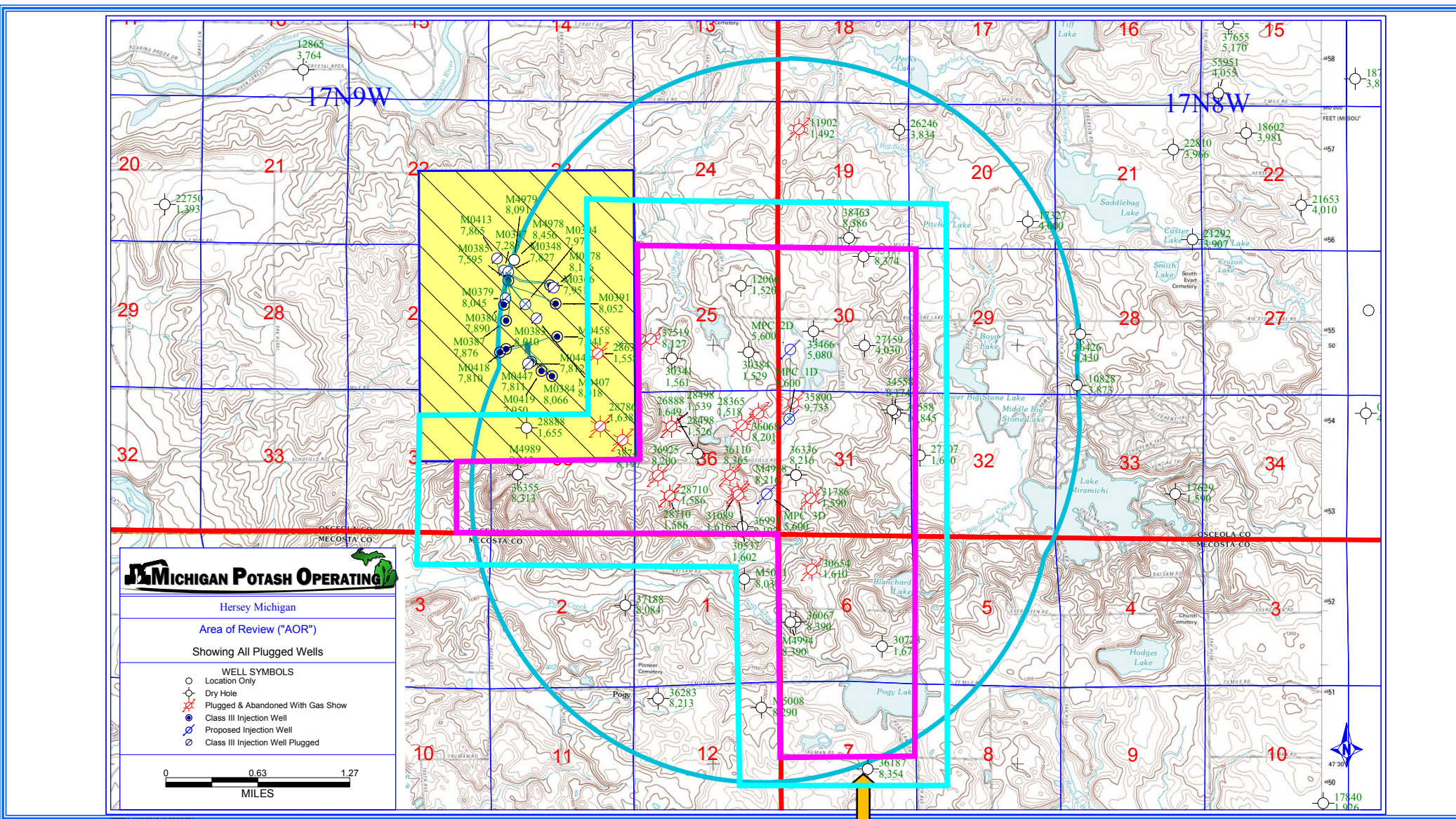


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**STEIN 1-7**  
NE NW SE Sec 7 T16N R8W  
MECOSTA COUNTY, MI  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

24" CONDUCTOR DRIVEN TO 59'

17-1/2" Hole expected

**SURFACE CASING**

13 3/8", 48#/ft

SET @ 842' KB

CMT w/900 SX TO SURFACE

12-1/4" Hole expected

**INTERMEDIATE CASING**

9 5/8", 40#/ft

SET @ 5525' KB

CMT w/250 SX TO SURFACE

5400'

**PROD. CASING**

NA

RAN DRILL PIPE TO 8350', SPOTTED 460 SX POZ TO 5400',  
CAME OUT, CUT AND PULLED 1500' OF 9-5/8".

RAN DRILL PIPE TO 5400' AND CEMENTED TO SURFACE  
WITH 1635 SX CLASS A.

TD @ 8380' KB

API No. 21-107-36187-0000

GL @ 1197.5'

KB @ 1214'

WELL COMPLETION DATE: DRY HOLE (NA)

PLUGGING COMPLETION DATE: 12/2/82



**STEIN 1-7 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
11/3/1982	SPUD.
11/30/1982	DRILLING COMPLETED. FORMATION AT TD CINCINNATIAN. 24" CONDUCTOR SET AT 59' 13 3/8" SET AT 842'; 900 SX 9 5/8" SET AT 5525'; 250 SX
12/1/1982	PLUGGING START DATE RAN DRILL PIPE TO 8350' AND SPOTTED 460 SX POZ TO 5400', CAME OUT AND PULLED 1500' OF 9-5/8". RAN DRILL PIPE TO 5400' AND CEMENTED TO SURFACE WITH 1635 SACKS CLASS A.
12/2/1982	PLUGGING COMPLETED.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit to DNR within 30 days after Well Completion

JAN 4 1983

PERMIT NUMBER

36187

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Willmet, Inc. 2250 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Stein #1-7						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE NW SE		SECTION 7	TOWNSHIP 16N	RANGE 8W	TOWNSHIP NAME Chippewa		
FOOTAGES (North/South) 460 Ft. from North		Line and 854		(East/West) Ft. from West		COUNTY NAME Mecosta	
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		Line and		(East/West) Ft. from		COUNTY NAME	
DATE	DRILLING BEGUN 11-3-82		TOTAL DEPTH OF WELL Driller 8380 Log 8354		TYPE WELL Dry Hole		ELEVATIONS
	DRILLING COMPLETED 11-30-82		FORMATION AT T.D. Cincinnatian		FT. DRLD. - ROTARY TOOLS From 0 To 8380		
	WELL COMPLETED		PRODUCING FORMATION(S)		FT. DRLD. - CABLE TOOLS From To		
					K.B. 1214	R.F. 1212.6	
					R.T.	Grd. 1197.5	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
24"	59'						YES	NO
13 3/8"	842'	900 Sx						
9 5/8"	5525'	250 Sx	1500			None		

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
None							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Black Line	Gas	5120					X	
				E Unit	Gas	6668					X	
				Strickler Zone	Gas	8170					X	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	None		None				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	100-8354	1926		1926	3/4°			
Birdwell		Sonic	100-8354							
Q-Tool		MLL-DLL	3400-8354							

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 12-29-82	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E Booker</i>
------------------	--	--------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

DEC 27 1982

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

## PERMIT TO PLUG AND ABANDON

## DNR DISTRIBUTION

Permittee — Orig. & 1 copy  
Division Office — 2 copies  
Field Office — File copy  
Others — On request

PERMIT NUMBER

56187

FIELD NAME

## NAME AND ADDRESS OF PERMITTEE

Wilmet, Inc., 1230 Enterprise Drive, Mt. Pleasant, MI 48858

## LEASE NAME AND WELL NO.

Sagin 1-7

## LOCATION (1/4 1/4 or other)

NE NW SE

## SECTION

7

T10N R 8W

## TOWNSHIP

Chippewa

## COUNTY

Macatawa

## TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole

## DATE COMPLETED

11-30-82

## DATE PLUGGING WILL START

12-1-82

## PLUGGING PERMIT REQUESTED BY &amp; DATE

Steve Wood

11-30-82

## LAST PRODUCTION

BOPD

BWPD

MCFGPD

DATE

## PLUGGING TO BE DONE BY

Provins/Dowell

## PERMIT MAILED TO

Don Smith  
Wilmet, Inc.

## COPIES MAILED TO

Lansing  
Region II

## CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP.	PERFORATIONS
	24"	39'	Drill		
17 1/2"	13-3/8" 420	842'	700 cu 20/30 sand + 200 cu Class A	Surf.	
12 1/2"	9-5/8" 43/400	3330'	250 cu Class A	4630'	
8 1/2"	Open Hole to T.D.				

## GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

~~CONFIDENTIAL~~

## PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

Fill open hole with cement bottom to top, recover from casing, per Mineral Wells requirements.

Final cleanup to be completed by June 15, 1983.

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 186 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

James H. Skipper

OFFICE

Mt. Pleasant

DATE

12-16-82

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

R-7228  
Rev. 11/77

JAN 4 1983

JAN 12 1983

LANSING HAS COPY

Mt. Pleasant HAS COPY

# WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER  
36187

FIELD NAME

AUG 0 1984

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER Willmet, Inc.			
COMPLETE LEASE OR FARM NAME(S) Stein			WELL NUMBER 1-7
WELL LOCATION NE ¼ NW ¼ SE ¼ SEC. 7 T. 16N R. 8W		TOWNSHIP Chippewa	COUNTY Mecosta
TYPE OF WELL (Oil, Gas, Dry Hole, etc.) Dry Hole		TOTAL DEPTH 8380	FORMATION Cincinnatian
DATE PLUGGING STARTED 12-1-82	DATE PLUGGING COMPLETED 12-2-82	DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING Jim Skipper	

CASING RECORD			
SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	59'		
13 3/8"	842'	900 Sx	
9 5/8"	5525'	250 Sx	1500

BRIDGES OR PLUGS		
TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	5400-8350	460 Sx POZ
Cement	0 -5400	1635 Sx C1 A

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, give details:
Did a Service Company pump mud, spot cement, or set bridge plugs?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	If yes, give name and address: Dowell
Was the well plugged by a Company or Contractor other than Owner or Operator?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, give name and address:
Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:	Marvin Woods	

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Ran drill pipe to 8350, spotted 460 sacks to 5400, came out, cut and pulled 1500' of 9 5/8". Ran drill pipe to 5400' and cemented to surface with 1635 sacks.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION		
"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."		
NAME AND TITLE (Typed or Printed) William E. Booker, Geologist	COMPANY NAME AND ADDRESS Strickler Geological Services, Inc. 1425 S. Mission Mt. Pleasant, MI 48858	
SIGNATURE <i>William E. Booker</i>	DATE (Month, Day, Year) 12-29-82	

## OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

**Supplemental Plugging Data and Site Conditions:**

9/22/83 Clean, recastored

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

**SIGNATURE**

James H. Skipper

DIVISION

Geological Survey

DATE \_\_\_\_\_

8/1/84



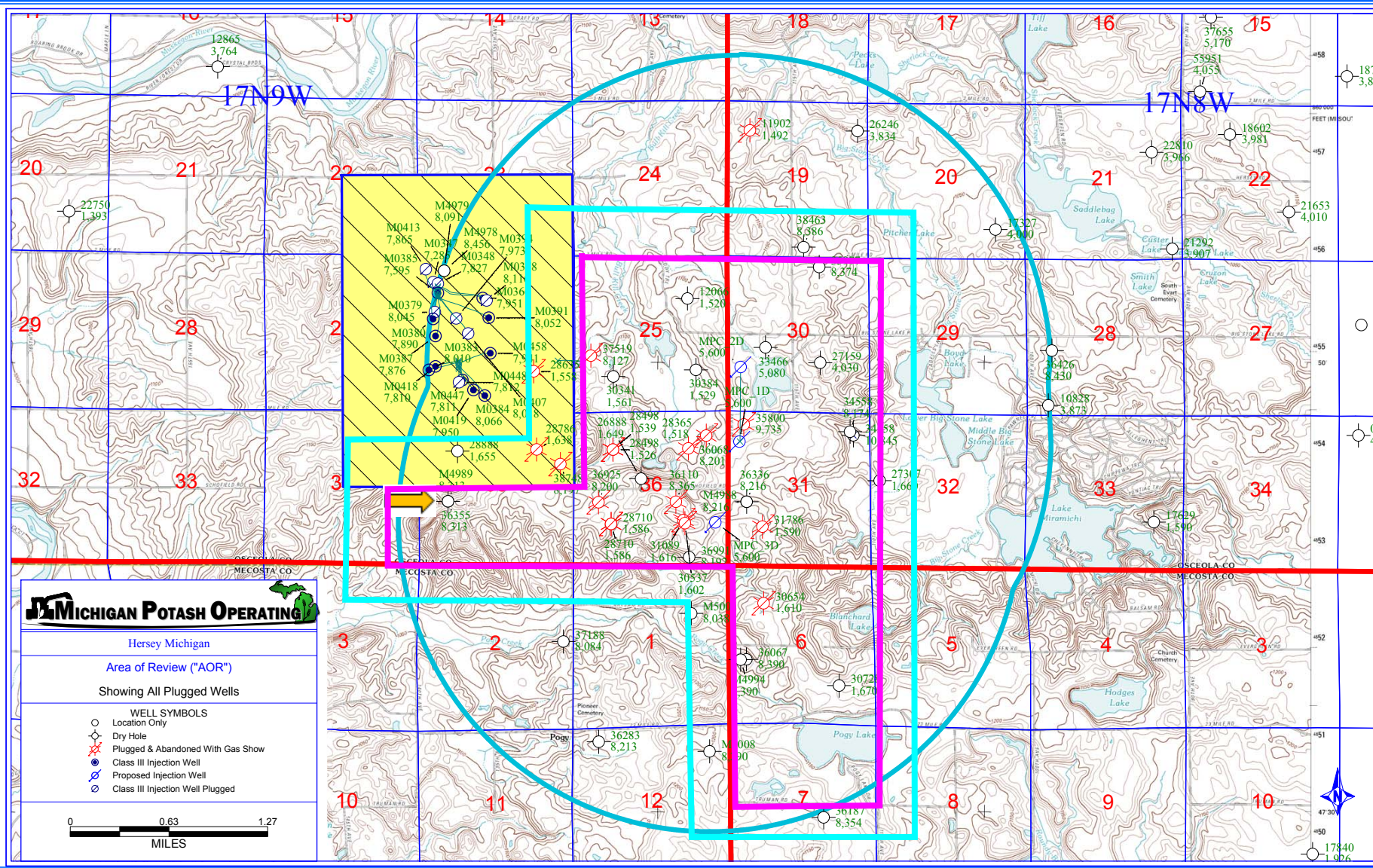


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**STATE-HERSEY 2-35**  
**NE NW SW Sec 35 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

**UPDATED APRIL 2014 BY JLT**

24" CONDUCTOR DRIVEN TO 72'

14-3/4" Hole expected

**SURFACE CASING**

11-3/4"; 48#/ft.

SET @ 954' KB

CMT w/500 SX TO SURFACE

10-5/8" Hole expected

**INTERMEDIATE CASING**

8-5/8"; 60#/ft.

SET @ 5540' KB

CMT w/ 1110 SX TO SURFACE

5540'

5500'

**PROD. CASING**

NA

**PLUGGING**

RAN DRILL PIPE TO 8310', SPOTTED 120 SX CMT

PULLED DP TO 7909', SPOTTED 120 SX

PULLED DP TO 6850', SPOTTED 60 SX

PULLED DP TO 6650', SPOTTED 145 SX

REMAINDER OF HOLE SAVED FOR POSSIBLE KICK OFF WELL  
TOC ESTIMATED AT 5500'

**TD @ 8310' KB**

API No. 21-133-36355-0000  
GL @ 1213'  
KB @ 1236'  
WELL COMPLETION DATE: (NA)  
PLUGGING COMPLETION DATE: 1/30/83



**STATE-HERSEY 2-35 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
1/2/1983	SPUD.
1/28/1983	DRILLING COMPLETED. FORMATION AT TD CINCINNATIAN. 24" CONDUCTOR DRIVEN TO 72' 11-3/4" SET AT 954'; 550 SX 8-5/8" SET AT 5540'; 1110 SX
1/29/1983	PLUGGING STARTED RAN DRILL PIPE TO 8310' AND SPOTTED 120 SX, PULLED DRILL PIPE TO 7909' AND SPOTTED 120 SX PULLED DRILL PIPE TO 6850' AND SPOTTED 60 SX PULLED DRILL PIPE TO 6650' AND SPOTTED 145 SX  REMAINDER OF HOLE TO BE SAVED FOR POSSIBLE KICK OFF WELL
1/30/1983	PLUGGING COMPLETION DATE

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

FEB 25 1983

PERMIT NUMBER  
36355

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Willmet, Inc., Rousek + Muskegon Dev. 2250 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Company 2113 Enterprise Drive Mt. Pleasant, MI 48858				
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT State-Hersey #2-35						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		
SURFACE LOCATION NE NW SW		SECTION 35		TOWNSHIP 17N		RANGE 9W		
TOWNSHIP NAME Hersey								
FOOTAGES (North/South) 460 Ft. from North Line and 854 Ft. from West Line of quarter section						COUNTY NAME Osceola		
SUBSURFACE LOCATION		SECTION		TOWNSHIP		RANGE		
TOWNSHIP NAME								
FOOTAGES (North/South) Ft. from Line and Ft. from Line of quarter section						COUNTY NAME		
D A T E	DRILLING BEGUN 1-2-83		TOTAL DEPTH OF WELL Driller 8310 Log 8313		TYPE WELL Temp. Aband.		ELEVATIONS	
	DRILLING COMPLETED 1-28-83		FORMATION AT T.D. Cincinnatian		FT. DRLD. - ROTARY TOOLS From 0 To 8310		K.B. 1236	R.F. 1235
	WELL COMPLETED		PRODUCING FORMATION(S) None		FT. DRLD. - CABLE TOOLS From To		R.T.	Grd. 1213

**CASING, CASING LINERS AND CEMENTING**

**PERFORATIONS**

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
							YES	NO
24"	72'	D.P.						
11 3/4"	954	550 Sx		NONE				
8 5/8"	5540	1110 Sx						

**GROSS PAY INTERVALS**

**ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED**

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
NONE				Trav. Lime	Gas	1700					X	
				Reed City Do	Gas	4100					X	
				Sour Zone	Gas	4700					X	

**STIMULATION BY ACID OR FRACTURING**

**WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)**

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
NONE			NONE				

**MECHANICAL LOGS, LIST EACH TYPE RUN**

**DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK**

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	XX	LDT-CNL-GR	200 - 8313			2500	0°			
Birdwell		Sonic	200 - 8313			5100	1°			
		DLL-MLL	3300 - 8313			6500°	0°			
						6900	3/4°			

**PRODUCTION TEST DATA**

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 2-21-83	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William Booker</i>
-----------------	--	------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

## STATE OF MICHIGAN

TYPE OR PRINT

## REQUEST FOR TRANSFER OF A PERMIT

SUBMIT 4 COPIES TO:

Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

Filing for change of ownership of well is required in accordance with Act 61, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO 36355	WELL TYPE Dry Hole
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER St. Hersey 2-35	
WELL LOCATION NE 1/4 NW 1/4 SW 1/4 SECTION 35 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

## TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

Adolph Rovsek, Muskegon Development Corp. &amp; Willmet, Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by:

Owner(s)

Representative(s)

Signature(s)

Date(s)

Willmet, Inc., Richard M. Rompala

Muskegon Development Corp.

Adolph Rovsek

*Richard M. Rompala* 3/31/88  
*Jeffrey C. Meyer*  
*Adolph Rovsek*

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

## TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐ SINGLE WELL☐ ATTACHED

BONDING CO. SAFECO Insurance Company of America

☒ BLANKET☒ ON FILE

BOND NUMBER 5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Donald R. Hall 223

*Donald R. Hall* March 28, 1988

## FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*Stephen J. Lyszkowski* 7/6/88

DISTRIBUTION BY DNR

- ☒ Lansing  
☐ Acquiring Owner  
☐ Selling Owner  
☐ Field

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

PERMIT NUMBER 36355  
FIELD NAME Hersey

PERMIT TO PLUG AND ABANDON MAR 16 1983

COPIES DISTRIBUTION  
Permittee -- Orig & 1 copy  
Division Office -- 2 copies  
Field Office -- File copy  
Others -- On request

NAME AND ADDRESS OF PERMITTEE  
Willmet

LEASE NAME AND WELL NO  
State Hersey #2-35

LOCATION (1/4, 1/2, 1/4 or other) SECTION TOWNSHIP COUNTY  
NE NW SW, 35 17N 9W Hersey Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.) DATE COMPLETED DATE PLUGGING W. START PLUGGING PERMIT REQUESTED BY & DATE  
Dry hole 1/28/83 1/29/83 M. Woods 1/28/83

LAST PRODUCTION PLUGGING TO BE DONE BY  
BUPD BWPD MCFGPD DATE Provins #9

PERMIT MAILED TO  
Willmet

CASING AND CEMENTING RECORD

HOLE DIA	CASING DIA. & WT/FT	DEPTHS SET	CEMENT QUANTITY TYPE ADDITIVES	CMT TOP	PERFORATIONS
	16"	72			
	11 3/4"	954	550	surf	
	8 5/8"	5544	1100	70	

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

CONFIDENTIAL

PLUGGING REQUIREMENTS:

Plugging requirements outlined are to be executed in accordance with the provisions of Act 53 of 1974 and orders adopted thereunder.

PI AS PER MINERAL WELLS:

Spot 120 sx cmt. at 8310'; spot 120 sx cmt. at 7909'; spot 60  
sx at 6850' (for possible KOP); spot 145 sx at 6650 (TOC 5500')  
Remainder of hole to be saved for possible kick off well.

NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965. GROUND WATER QUALITY CONTROL is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974, CL 460 701 to 460 718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature) OFFICE DATE  
Cadillac D#6 3/14/83

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

R-7229  
Rev 11/77

This document paid for with State funds

FEB 25 1983

LANSING HAS COPY  
CADILLAC HAS COPY

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

FEB 25 1983

PERMIT NUMBER

36355

FIELD NAME

MARATHON

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

Willmet, Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

State-Hersey

WELL NUMBER

2-35

WELL LOCATION

NE ¼ NW ¼ SW ¼ SEC. 35 T. 17N R. 9W

TOWNSHIP

Hersey

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole

TOTAL DEPTH

8313

FORMATION

Cincinnatian

DATE PLUGGING STARTED

1-29-83

DATE PLUGGING COMPLETED

1-30-83

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Snider

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	72'	---	
11 3/4"	954'	---	
8 5/8"	5540'	---	

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	7909-8310	120 Sx
Cement	6850-7909	120 Sx
Cement	6650-6850	60 Sx
Cement	5500-6650	145 Sx

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Dowell

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Marvin Woods

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Ran drill pipe to 8310, spotted 120 sx, pulled drill pipe to 7909 and spotted 120 sx, pulled drill pipe to 6850 and spotted 60 sx, pulled drill pipe to 6650 and spotted 145 sx.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William E. Booker, Geologist

COMPANY NAME AND ADDRESS

Strickler Geological Services, Inc.  
1425 S. Mission  
Mt. Pleasant, MI 48858

SIGNATURE

*William E. Booker*

DATE (Month, Day, Year)

2-21-83



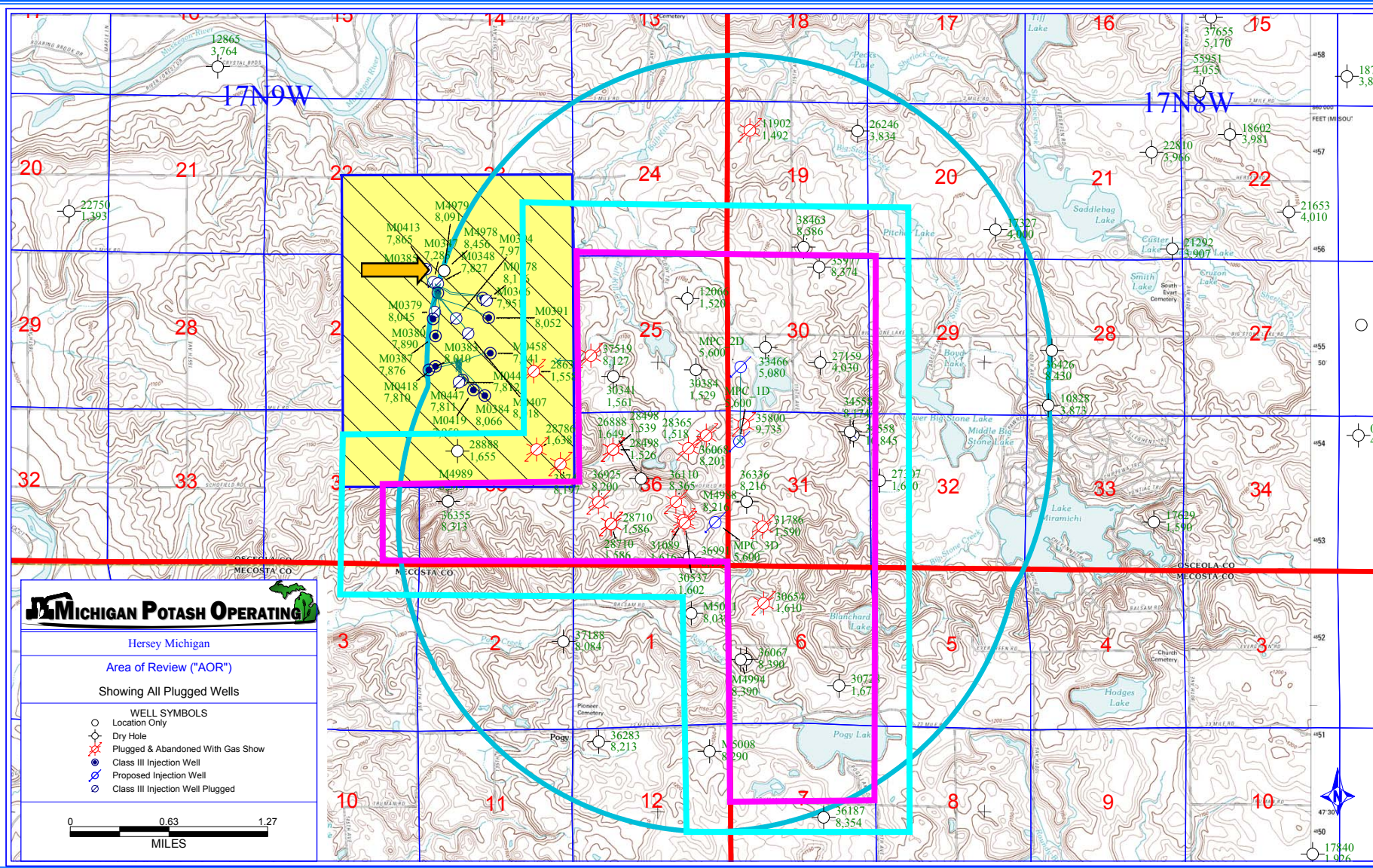
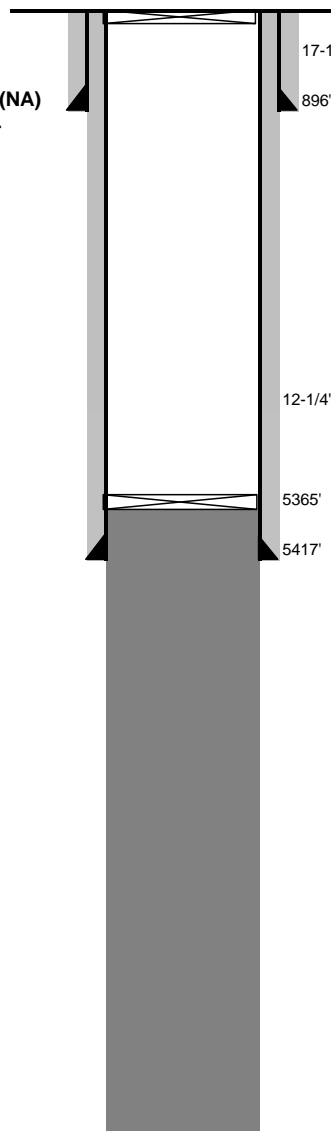


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**THOMAS 1-26**  
**NE NW NW Sec 26 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

API No. 21-133-336600-0000  
GL @ 1121.6'  
KB @ 1137.2'  
WELL COMPLETION DATE: DRY HOLE (NA)  
PLUGGING COMPLETION DATE: 1/8/84



UPDATED APRIL 2014 BY JLT  
20" CONDUCTOR DRIVEN TO 68'  
17-1/2" Hole expected  
**SURFACE CASING**  
13 3/8", 48#/ft  
SET @ 896' KB  
CMT w/700 SX TO SURFACE

12-1/4" Hole expected  
**INTERMEDIATE CASING**  
9 5/8", 40#/ft  
SET @ 5417' KB  
CMT w/1700 SX TO SURFACE  
5365'  
5417'

**PROD. CASING**  
NA

**PLUGGING**  
RAN IN OPEN ENDED TO 8085' AND SPOTTED 200 SX CLASS A,  
TRIPPED OUT AND RAN BACK IN WITH BAKER BP TO 5365'  
SET BRIDGE PLUG, TRIPPED OUT AND WELDED STEEL PLATE  
ON TOP. DIRECTIONALLY REDRILLED UNDER MW 020-841-367  
ON 4/30/84

TD @ 8085' KB



THOMAS 1-26 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
3/12/1983	SPUD.
1/6/1984	DRILLING COMPLETED. FORMATION AT TD CABOT HEAD. 20" CONDUCTOR SET AT 68' 13 3/8" SET AT 896'; 700 SX 9 5/8" SET AT 5417'; 1700 SX
1/7/1984	PLUGGING START DATE RAN IN OPEN ENDED TO 8085' AND SPOTTED 200 SX CLASS A, TRIPPED OUT AND RAN BACK IN WITH BAKER BRIDGE PLUT TO 5365' - SET BRIDGE PLUG, TRIPPED OUT AND WELDED STEEL PLATE ON TOP. DIRECTIONALLY REDRILLED UNDER MW 020-841-367 ON 4-30-84.
1/8/1984	PLUGGING COMPLETED.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in DUPLICATE Within 30 Days after Well Completion

FEB 17 1984

PERMIT NUMBER

36600

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG Oil & Gas Co., Inc. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Company 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Thomas #1-26						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE NW NW		SECTION 26	TOWNSHIP 17N	RANGE 9W	TOWNSHIP NAME Hersey		
FOOTAGES (North/South) 460 Ft. from North		FOOTAGES (East/West) 864 Ft. from West		COUNTY NAME Osceola			
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		FOOTAGES (East/West)		COUNTY NAME			
Ft. from		Ft. from		Line of quarter section			
DATE	DRILLING BEGUN 3-12-83		TOTAL DEPTH OF WELL Driller 8085 Log 8091		TYPE WELL Temp. Abandoned		ELEVATIONS
	DRILLING COMPLETED 1-06-84		FORMATION AT T.D. Cabot Head		FT. DRLD. - ROTARY TOOLS From 0 To 8091		
	WELL COMPLETED		PRODUCING FORMATION(S)		FT. DRLD. - CABLE TOOLS From To		
					K.B. 1137.2	R.F. 1135.8	
					R.T.	Grd. 1121.6	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
20"	68	DP					YES	NO
13 3/8	896	700 SX						
9 5/8	5417	1700 SX						

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
None				Antrim	Gas	3050	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Trav. lm	Gas	3596					XX	
				Burnt Bluff	Gas	7982					XX	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	None		None				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	XX	LDT-CNL-CR	100 - 8091			1500	3/4°			
Birdwell		Sonic	897 - 8091			3700	3/4°			
		DLL-MLL	3200 - 5405			5093	1/4°			
			5420 - 8076			7816	2 1/2°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 2/15/84	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E. Booker</i>
-----------------	--	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

Redrill

PERMIT NUMBER

36600

FIELD NAME

Regulatory Control Unit

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc., 2258 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

Thomas

WELL NUMBER

1-36

WELL LOCATION

NE ¼

NW ¼

NW ¼ SEC. 26

T. 17N

R. 9W

TOWNSHIP

Hersey

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Temporarily Abandoned

TOTAL DEPTH

8091

FORMATION

Cabot Head

DATE PLUGGING STARTED

1-7-84

DATE PLUGGING COMPLETED

1-8-84

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Moss

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
20"	68	----	----
13 3/8"	898	----	----
9 5/8"	5417	----	----

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVE
Cement	8085	200 sx C1 A
Baker Bridge Plug	5365	----

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES

☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES

☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES

☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Carl Cookingham

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Ran in open ended to 8085 and spotted 200 sx Class A, tripped out and ran back in with Baker bridge plug to 5365 - set bridge plug, tripped out and welded steel plate on top. Directionally redrilled under MW 020-841-367 on 4-30-84.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William E. Booker, Geologist

SIGNATURE

William E. Booker

DATE (Month, Day, Year)

2/15/84

COMPANY NAME AND ADDRESS

Strickler Geological Services, Inc.

1425 S. Mission

Mt. Pleasant, MI 48858

7/29/85: Location re-drilled under MW020-841-367.  
OK for GS approval. (SNIDER)

John M. Snider

Geology

7/29/85

DNR DISTRIBUTION Permittee -- Orig & 1 copy Division Office -- 2 copies Field Office -- File copy Others -- On request	AUG 05 1985	STATE OF MICHIGAN DEPARTMENT OF NATURAL RESOURCES GEOLOGICAL SURVEY DIVISION	PERMIT NUMBER 36600
Regulatory Control PERMIT TO PLUG AND ABANDON			FIELD NAME Hersey

NAME AND ADDRESS OF PERMITTEE  
PPG Oil & Gas Co., Inc.

LEASE NAME AND WELL NO.  
Thomas #1-26

LOCATION (1/4 1/2 or other) SECTION TOWNSHIP COUNTY  
NE NW NW, 26 T17N R 9W Hersey Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.) DATE COMPLETED DATE PLUGGING WILL START PLUGGING PERMIT REQUESTED BY & DATE  
Dry hole 1/7/84 1/7/84 Don Smith 1/7/84

LAST PRODUCTION PLUGGING TO BE DONE BY  
BOPD BWPD MCFGPD DATE Halliburton

PERMIT MAILED TO COPIES MAILED TO

CASING AND CEMENTING RECORD					
HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP.	PERFORATIONS
	20"	68'			
	13-3/8"	898'			
	9-5/8"	5417'			

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

C O N F I D E N T I A L

PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

RIH. Spot 200 sx C1 A cmt. 8085'; set Baker BP at 5365';  
remainder of hole used for directional redrill under MW020-841-367.

\*NOTE. BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature) <i>John M. Dwyer</i>	OFFICE Cadillac D#6	DATE 7/26/85
---	------------------------	-----------------

NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

R-7220  
Rev. 11/77



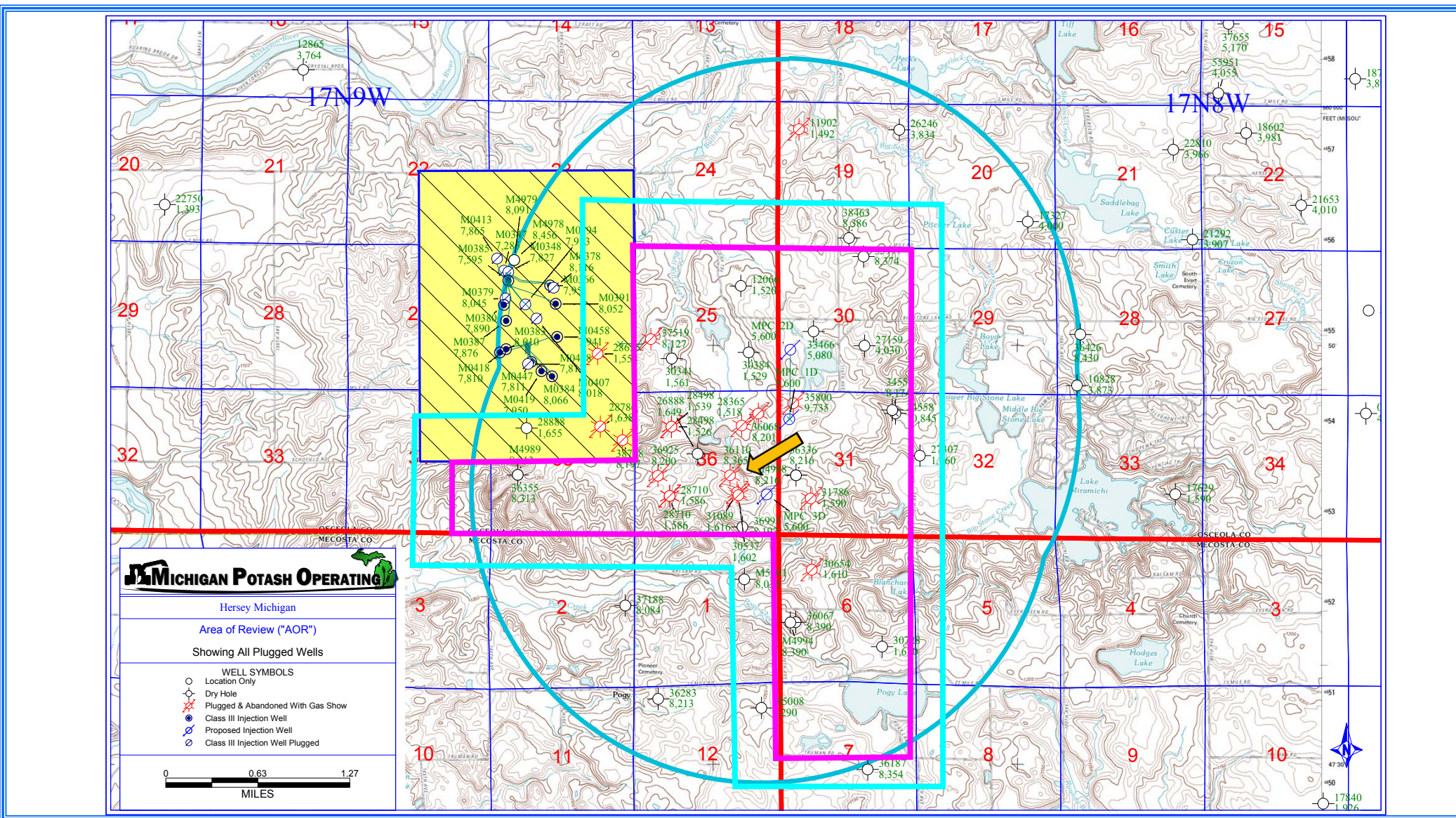
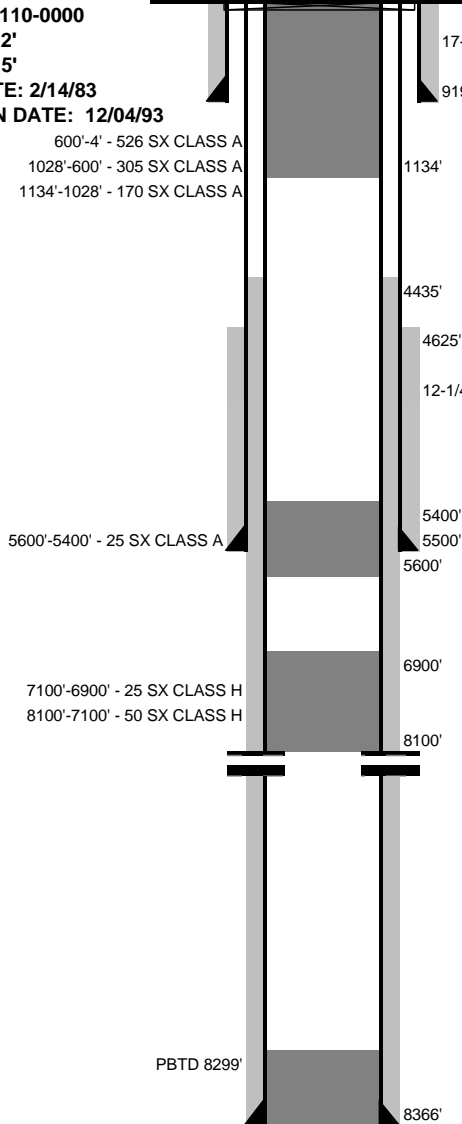


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**THOMPSON 3-36**  
**NE NW SE Sec 36 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

UPDATED APRIL 2014 BY JLT

API No. 21-133-36110-0000  
GL @ 1177.2'  
KB @ 1200.5'  
WELL COMPLETION DATE: 2/14/83  
PLUGGING COMPLETION DATE: 12/04/93



**SURFACE CASING**

13 3/8", 48#/ft  
SET @ 919' KB  
CMT w/700 SX POZ MIX + 200 SX CLASS ATO SURFACE

**INTERMEDIATE CASING**

9 5/8", 43.5#/ft  
SET @ 5500' KB  
CMT w/300 SX SPECIAL  
TOC @ 4625'

**BURNT BLUFF PERFORATIONS**

8141'-8144' - 13 HOLES  
8142'-8152' 2X/ft - SQUEEZED w/25 SX CLASS A  
8159'-8162' 2X/ft - SQUEEZED w/25 SX CLASS A

**PROD. CASING**

5-1/2", 17#/ft  
SET @ 8366' KB  
CMT w/1050 SX POZ MIX + 150 SX SPECIAL 11  
TOC @ 4435'

**PLUGGING**

8100'-7100' - 50 SX CLASS H  
7100'-6900' - 25 SX CLASS H  
5600'-5400' - 25 SX CLASS A  
1134'-1028' - 170 SX CLASS A  
1028'-600' - 305 SX CLASS A  
600'-4' - 526 SX CLASS A  
PULLED 4' 13-3/8" csg, 3997.45' 9-5/8" csg, 4043' 5-1/2" csg

TD @ 8366' KB  
PBTD @ 8299' KB



**THOMPSON 3-36 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
9/25/1982	SPUD.
2/14/1983	DRILLING COMPLETED. FORMATION AT TD CINCINNATIAN. PRODUCING FORMATION CLINTON. 13 3/8" SET AT 919'; 900 SX 9 5/8" SET AT 5500'; 300 SX 5-1/2" SET AT 8366'; 1200 SX
4/22/1985	REWORK START DATE
	MIRU, KILL WELL, ND TREE, NU BOP's
4/23/1985	UNSEAT PACKER AND CIRC. HOLE CLEAN TO 8210'. TRIP OUT, LD PACKER, PU CEMENT RETAINER, TRIP IN TO 4000'
4/24/1985	SET RETAINER AT 8115', RUN INJECTION TEST, SQUEEZE PERS 8142-52' * 8159-62' WITH 25 SX CLASS A. TOO H, WOC.
4/25/1985	DRILL OUT SQUEEZE. CLEAN OUT HOLE TO 8299 (PBSD)
4/27/1985	SPOT ACID. PERF 8141-44' (13 HOLES). TIH TO 8095.
4/28/85 & 4/30/85	SWAB AND FLOW TEST; 3-400 MCF & 25 BBLS WATER;
5/1/1987	DATE LAST PRODUCED (21 MDF/D & 42 BWPD TEMPORARILY ABANDON WELL, SECURE WELLHEAD WITH CHAINS AND LOCK. DEPRESSURIZE SURFACE EQUIPMENT. EXTENSION GRANTED TO JUNE 13, 1989, FOR DECISION AS TO PLUG OR REQUEST TO HOLD AS TA FOR A BD WELL IN PERMISSION GIVEN TO TEMPORARILY ABANDON WELL TILL JUNE 13, 1991 FOR POSSIBLE RECOMPLETION AS A WATER DISPOSAL WELL.
11/8/1993	PLUGGING START DATE 8100'-7100' - 50 SX CLASS H 7100'-6900' - 25 SX CLASS H 5600'-5400' - 25 SX CLASS A 1134'-1028' - 170 SX CLASS A 1028'-600' - 305 SX CLASS A 600'-4' - 526 SX CLASS A; CUT 13-3/8" OFF 5' BELOW GROUND AND WELDED PLATE ON TOP PULLED 4' 13-3/8" csg, 3997.45' 9-5/8" csg, 4043' 5-1/2" csg
12/4/1993	PLUGGING COMPLETION DATE

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

FEB 22 1983

PERMIT NUMBER <b>36110</b>
DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT <b>Willmet, Inc. 2250 Enterprise Drive Mt. Pleasant, MI 48858</b>				NAME & ADDRESS OF DRILLING CONTRACTOR(S) <b>T. D. Provins Drilling Co. 2113 Enterprise Drive Mt. Pleasant, MI 48858</b>				
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT <b>Thompson #3-36</b>						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		
SURFACE LOCATION <b>NE NW SE</b>		SECTION <b>36</b>		TOWNSHIP <b>T17N</b>		RANGE <b>R9W</b>		
TOWNSHIP NAME <b>Hersey</b>		COUNTY NAME <b>Osceola</b>		FOOTAGES (North/South) <b>460</b> Ft. from <b>North</b> Line and <b>850</b> Ft. from <b>West</b> Line of quarter section				
SUBSURFACE LOCATION		SECTION		TOWNSHIP		RANGE		
TOWNSHIP NAME		COUNTY NAME		FOOTAGES (North/South)				
				Line and		Ft. from		
				Line of quarter section				
DATE	DRILLING BEGUN <b>9-25-82</b>		TOTAL DEPTH OF WELL Driller <b>8366</b> Log <b>8362</b>		TYPE WELL <b>Gas</b>		ELEVATIONS	
	DRILLING COMPLETED <b>10-31-82</b>		FORMATION AT T.D. <b>Cincinnatian</b>		FT. DRD. - ROTARY TOOLS From <b>0</b> To <b>8362</b>		K.B. <b>1200.5</b>	R.F. <b>1199.2</b>
	WELL COMPLETED <b>2-14-83</b>		PRODUCING FORMATION(S) <b>Clinton</b>		FT. DRD. - CABLE TOOLS From To		R.T.	Grd. <b>1177.2</b>

**CASING, CASING LINERS AND CEMENTING**

**PERFORATIONS**

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
13 3/8	919'	900					YES	NO
9 5/8	5500'	300		1-5-83	2x/ft	8159 - 8162		XX
5 1/2	8366'	1200		1-6-83	2x/ft	8142 - 8152	XX	

**GROSS PAY INTERVALS**

**ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED**

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
Clinton	Gas						Samples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Traverse Lm	Gas	3420					X	
				Reed City	Gas	4150					X	
				Sour Zone	Gas	4700					X	

**STIMULATION BY ACID OR FRACTURING**

**WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)**

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
1-6-83	8142-8152	Acid 500 Gals.	None				

**MECHANICAL LOGS, LIST EACH TYPE RUN**

**DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK**

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	200-8362			2700	1/2°	X		8247
Birdwell		DLL-MLL	3300-8362			5100	3/4°			
		Sonic	200-8362			7461	1°			
						8340	1°			

**PRODUCTION TEST DATA**

Last Perf.

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
		Nil	3000	2	Nil	4659 8152

( I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE <b>2-15-83</b>	NAME AND TITLE (PRINT) <b>William E. Booker, Geologist</b>	SIGNATURE <i>William Booker</i>
------------------------	---	------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

DEPARTMENT OF NATURAL RESOURCES  
Geological Survey Division

REQUEST FOR CHANGE OF OWNERSHIP OF A PERMIT  
(Submit all copies)

AUG 1 1983

Please Change:

Permit No. 36110 Type Well Oil & Gas Field Name Hersey-Clinton Pool

Owned by Willmet, Inc.

Address 2258 Enterprise Dr., Mt. Pleasant, MI 48858 (517) 773-3949  
(street) (town) (state) (zip) (phone)

for Thompson No. 3-36 located in the NE 1/4 NW 1/4 SE 1/4

section 36, T. 17N, R. 9W, Hersey Township, Osceola County,

to PPG Oil & Gas Co., Inc.  
(acquiring owner-complete names please)

All operating rights are discharged by (us) (me).

(Owner) (Representative)

Willmet, Inc.

(Signature) (Date)

Donald D. Metzger 7-29-83

THE SUPERVISOR IS PROHIBITED BY STATUTE FROM ISSUING A PERMIT TO ANY PERSON WHO IS NOT IN COMPLIANCE WITH THE PROVISIONS OF THE ACT, THE RULES, OR THE ORDERS OF EITHER THE SUPERVISOR OR THE NATURAL RESOURCES COMMISSION. ELIGIBILITY FOR PERMITS IS CONDITIONED ON COMPLIANCE WITH SUCH RULES AND ORDERS IN A DILIGENT MANNER AND IN ACCORDANCE WITH ACCEPTED OIL FIELD PRACTICE.

(We) (I) have acquired the well under this permit and assume full responsibility for drilling, operation, and abandonment in conformity with the law, regulations and orders issued by the Supervisor of Wells. The bond(s) required is attached or already on file.

PPG Oil & Gas Co., Inc.

(acquiring owner-complete names please)

Address 2258 Enterprise Dr., Mt. Pleasant, MI 48858 (517) 773-3949  
(street) (town) (state) (zip) (phone)

All operating rights and responsibilities are assumed by (us) (me).

(Owner) (Representative)

PPG Oil & Gas Co., Inc.

(Signature) (Date)

Donald D. Metzger 7-29-83

THE DEPARTMENT OF NATURAL RESOURCES

Approved. Stephan J. Langhans

(Signature)

AUG 9 1983

(Date)

DNR USE ONLY

White, Lansing

Yellow, Acquiring Owner

Pink, Selling Owner

Blue, Field

R-7214 (Rev. 10-79)

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
SUPERVISOR OF WELLS

GEOLOGICAL SURVEY

MAY 06 1985

## WELL REWORK RECORD

FILE IN DUPLICATE WITHIN 30 DAYS AFTER COMPLETION OF REWORK OR DEEPENING  
(Replaces GS 38)

Regulatory Control Unit

PERMIT NUMBER 36110	DEEPENING PERMIT NUMBER	FIELD NAME Hersey
NAME AND ADDRESS OF WELL OWNER PPG Oil & Gas Co., Inc., 2258 Enterprise Drive, Mt. Pleasant, Michigan 48858		
LEASE OR FARM NAME Thompson		WELL NUMBER 3-36
WELL LOCATION NE NW SE	SECTION 36	T. 17N R. 9W Hersey
TOWNSHIP Hersey		COUNTY Osceola
WELL COMPLETED FOR (Oil, Gas, Gas Storage, Brine Disposal, Water Injection, etc.) Gas	TOTAL DEPTH AFTER REWORK 8366'	MECHANICAL LOGS RUN None
WELL COMPLETED IN (Name Rock Formation and Zone of Completion) Clinton/Burnt Bluff	DATE REWORK COMMENCED 4-22-85	DATE REWORK COMPLETED 4-30-85
NAME AND ADDRESS OF CONTRACTOR Lease Management, Mt. Pleasant and Halliburton, Mt. Pleasant		

## WELL CASING RECORD - BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
13-3/8	919	900	Poz & A				
9-5/8	5500	300	Hall. Spec				
5-1/2	8366	1200	Poz & H				
2-7/8	7635	Packer		8142	8152	500 Gal. 1-7-83	
				8159	8162		

## WELL CASING RECORD - AFTER REWORK (Indicate additions and changes only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
				8142	8152		Squeezed
				8159	8162		Squeezed
				8141	8144	500 Gal. 20% 4-27-85	

## DESCRIBE REWORK OPERATIONS IN DETAIL

- 4/22/85 - MIRU, kill well, ND tree, NU BOP's.
- 4/23/85 - Unseat packer and circ. hole clean to 8210'. Trip out, LD packer, PU cement retainer, trip in to 4000'.
- 4/24/85 - Set retainer at 8115', run injection test, squeeze perfs 8142-52' & 8159-62' with 25 sxs Class A. TOOH, WOC.
- 4/25/85 - Drill out squeeze. Clean out hole to 8299' (PBTD).
- 4/27/85 - Spot acid. Perf 8141-44' (13 holes). TIH to 8095.
- 4-28-85  
& - Swab and flow test.
- 4/30/85

IMPORTANT! SEE REVERSE SIDE

## GEOLOGICAL FORMATION RECORD OF DEEPENING

FROM	TO	FORMATION (type, color, hardness)	FROM	TO	FORMATION (type, color, hardness)
		SEE ORIGINAL 7210			

# DAILY PRODUCTION TEST RECORD

DAILY INJECTION TEST RECORD IF INJECTION WELL (OR BD

[illegible]

SIGNATURE (Well Owner or Authorized Representative)

ADDRESS (If different than well owner)

DATE (Month, Day, Year)

*Donald R. Hall* / Donald R. Hall

Same

May 3, 1985

NOTE: IF GAS WELL, RECORD FLOW TEST UNDER "DAILY PRODUCTION TEST RECORD"

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

LEAVE BLANK
DEEPENING PERMIT NUMBER
DATE ISSUED

APPLICATION  
TO  
CHANGE WELL STATUS  
(SUBMIT IN QUADRUPLICATE)

APR 05 1985

PERMIT NUMBER 36110
------------------------

FIELD NAME Hersey
----------------------

NAME AND ADDRESS OF WELL OWNER PPG Oil & Gas Co., Inc., 2258 Enterprise Drive, Mt. Pleasant, Michigan 48858
--

LEASE OR FARM NAME Thompson	WELL NUMBER 3-36
--------------------------------	---------------------

WELL LOCATION NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$	SECTION 36	T. 17N	R. 9W	TOWNSHIP Hersey	COUNTY Osceola
---	---------------	--------	-------	--------------------	-------------------

(Deepen, Plug Back, Convert to Injection or Disposal Well, Temporarily Abandon, etc.)

APPROVAL REQUESTED TO Set retainer or squeeze to reduce water production
---

DATE DRILLING COMPLETED 10-31-82	DATE LAST PRODUCED 2-20-85	LAST PRODUCTION (Amt/day) 0 OIL, 25 WTR., 350 M.C.F. GAS
-------------------------------------	-------------------------------	---

WORK TO BE DONE BY Lease Management, Dowell	WILL START (DATE) 4-8-85
--	-----------------------------

CASING AND CEMENTING RECORD			
SIZE CASING	DEPTH SET	NO. SACKS CEMENT	PERFORATIONS
13-5/8	919	900	
9-5/8	5500	300	
5-1/2	8366	1200	8159-62, 8142-52
2-7/8	7635		

FORMATION RECORD  
(Formation and depth, Oil, Gas & Wtr. shows, etc.)

See attached sheet

DESCRIBE PROPOSED WORK IN DETAIL:

1. Run production log to determine where water is entering wellbore.
2. If water is coming from 8159-62, set cement retainer at 8155. Swab perfs at 8142-52 to kick off - test and return to production.
3. If water is coming from 8142-52, set retainer at 8100. Squeeze with 75 sxs. WOC.
4. Drill out to 8175'.
5. Reperforate and stimulate with 500 gallons 28%. Perfs will be determined after logging.
6. Swab, test, return to production.

The proposed work as outlined above and approved by the Supervisor or his Authorized Representative will be executed in accordance with the provisions of Act 61, P.A. 1939 and the rules and regulations issued and adopted thereunder.

SIGNATURE (Well Owner or Authorized Representative) <i>Donald R. Hall</i>	DATE 3-28-85
APPROVED BY: <i>Michael J. [Signature]</i>	DATE 4/1/85
FIELD OFFICE CADILLAC	

NOTE: WELL REWORK RECORD, Form R-7212, is to be filled in DUPLICATE within 30 days after completion.

R 7237 3/73

STATE OF MICHIGAN  
REQUEST FOR TRANSFER OF A PERMIT

TYPE OR PRINT

SUBMIT 4 COPIES TO: Department of Natural Resources  
Geological Survey Division  
Box 30028  
Lansing, Michigan 48909

Filing for change of ownership of well is required in accordance with ☒ Act 81, P.A. 1939 and ☐ Act 315 P.A. 1969, as amended, and Administrative Rules promulgated thereunder.

PERMIT NO 36110	WELL TYPE Gas
FIELD NAME Hersey-Clinton	
WELL NAME AND NUMBER Thompson 3-36	
WELL LOCATION NE 1/4 NW 1/4 SE 1/4 SECTION 36 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola

TRANSFER OF A PERMIT FROM:

NAME(S) OF SELLING OWNER(S)

PPG Oil & Gas Co., Inc.

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

All operating rights are discharged by

Owner(s)

Representative(s)

Signature(s)

Date(s)

PPG Oil & Gas Co., Inc., Mr. Donald R. Hall

*Donald R. Hall* 12/14/87

ELIGIBILITY FOR PERMITS IS CONDITIONED UPON COMPLIANCE WITH THE STATUTES, RULES AND ORDERS OF THE DEPARTMENT OF NATURAL RESOURCES. PERMITS WILL NOT BE GRANTED TO PERSONS NOT IN COMPLIANCE.

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

TRANSFER OF A PERMIT TO:

NAME(S) OF ACQUIRING OWNER(S)

Marathon Oil Company

ADDRESS Number and Street -- City or Town -- State -- Zip Code -- Telephone

One Jackson Square, Suite 600, Jackson, MI 49201 (517) 782-8145

(We) (I) have acquired the well under this permit and assume full responsibility for the drilling, operation, and abandonment in conformity with the law, regulations and orders.

SURETY BOND:

☐ SINGLE WELL

☐ ATTACHED

BONDING CO. SAFECO Insurance Company of America

☒ BLANKET

☒ ON FILE

BOND NUMBER 5194219

All operating rights and responsibilities are assumed by

Owner(s)

Representative(s)

Signature(s)

Date(s)

Marathon Oil Company, Mr. David W. Hoopman

*D. W. Hoopman*

12/16/87

FOR DEPARTMENT OF NATURAL RESOURCES USE ONLY

APPROVED

*L. J. [Signature]*  
Signature

6/28/88  
Date

DISTRIBUTION BY DNR

- ☒ Lansing  
☐ Acquiring Owner  
☐ Selling Owner  
☐ Field



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☒ CHANGE WELL STATUS

☐ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☒ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION/INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

21 MCF/D 42 BWPD

WORK TO BE DONE BY: ☐ APPROVAL MAILED

NA

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
17-1/2	13-3/8 48#	919	700 Poz mix, 200 Class A	C1YC	
12-1/4	9-5/8 43.5	5,500	300 Special	4,625	
8-1/2	5-1/2 17#	8,366	1,050 Poz mix, 150 Special II	4,435	8141-44

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

See Attached.

DETAIL PROPOSED PROCEDURES:

Temporarily abandon well, secure wellhead with chains and lock. Depressurize surface equipment.

DNR ADDITIONAL REQUIREMENTS:

Permission given to temporarily abandon well for reservoir study until 12/31/88.

NAME/SIGNATURE (Authorized Representative)

Donald R. Hall, Production Superintendent

DATE  
07/07/88

APPROVED BY DNR

OFFICE

Cadillac

DATE  
12/31/88

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

RECEIVED BY AUTHORITY OF:

☒ 61. P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

A. APPLICATION TO (Submit 4 copies):

☒ CHANGE WELL STATUS ☐ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☒ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION/INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

21 MCF/D 42 BWPD

PERMIT NO.

36110

TYPE OF WELL

Gas

NAME AND ADDRESS OF WELL OWNER ☐ APPROVAL MAILED

Marathon Oil Company  
One Jackson Square, Ste. 600  
Jackson, MI 49201

JUL 11 1988

FIELD/FACILITY NAME

Hersey

WELL NAME

Thompson

WELL NO.

3-36

WELL LOCATION

NE 1/4 of NW 1/4 of SE 1/4 Section 36 T 17N R 9W

TOWNSHIP

Hersey

COUNTY

Osceola

DATE DRILLING COMPLETED

10/31/82

DATE LAST PRODUCED/UTILIZED

May 1987

WORK TO BE DONE BY: ☐ APPROVAL MAILED

NA

STARTING DATE

CASING AND CEMENTING RECORD

HOLE DIA	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
17-1/2	13-3/8 48#	919	700 Poz mix, 200 Class A	CITYC	
12-1/4	9-5/8 43.5	5,500	300 Special	4,625	
8-1/2	5-1/2 17#	8,366	1,050 Poz mix, 150 Special II	4,435	8141-44

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

5 Attached.

DETAIL PROPOSED PROCEDURES:

Temporarily abandon well, secure wellhead with chains and lock. Depressurize surface equipment.

Extension granted to June 13, 1989, for decision as to plug or request to hold as T.A. for a BD well in what may become a unitized gas field that is increasing in formation water.

ADDITIONAL REQUIREMENTS:

mission given to temporarily abandon well for reservoir study until 12/31/88.

SIGNATURE (Authorized Representative)

Donald R. Hall, Production Superintendent

*D.R. Hall*

DATE

07/07/88

PROVED BY OMR

*John McSpader*

OFFICE

Cadillac

DATE

12/31/88

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☒ CHANGE WELL STATUS ☐ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☒ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION/INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

21 MCF/D 42 BWPD

WORK TO BE DONE BY: ☐ APPROVAL MAILED

NA

PERMIT NO. 36110	TYPE OF WELL Gas
NAME AND ADDRESS OF WELL OWNER <input type="checkbox"/> APPROVAL MAILED Marathon Oil Company One Jackson Square, Suite 600 Jackson, MI 49201	
FIELD/FACILITY NAME Hersey	
WELL NAME Thompson	WELL NO. 3-36
WELL LOCATION NE 1/4 of NW 1/4 of SE 1/4 Section 36 T 17N R 9W	
TOWNSHIP Hersey	COUNTY Osceola
DATE DRILLING COMPLETED 10/31/82	DATE LAST PRODUCED/UTILIZED May 1987
STARTING DATE	

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP	PERFORATIONS
17-1/2	13-3/8 48#	919	700 Poz mix, 200 Class A	Circ	
12-1/4	9-5/8 43.5	5,500	300 Special	4,625	
8-1/2	5-1/2 17#	8,366	1,050 Poz mix, 150 Special II	4,435	8141-44

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

See attached

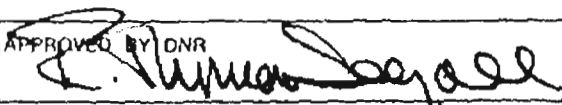
DETAIL PROPOSED PROCEDURES:

Temporarily abandon well, secure wellhead with chains and lock. Depressurize surface equipment.

Extension granted to June 13, 1989 for decision as to plug or request to hold as T.A. for a BD well in what may become a unitized gas field that is increasing in formation water.

ONR ADDITIONAL REQUIREMENTS:

Permission is given to temporarily abandon well till June 13, 1991 for possible recompletion as a water disposal well.

NAME/SIGNATURE (Authorized Representative)	DATE
APPROVED BY DNR 	
OFFICE Lansing	APPROVAL DATE 9/26/89
	TERMINATION DATE 6/13/91

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
BOX 30028  
LANSING, MICHIGAN 48909

REQUIRED BY AUTHORITY OF:

☒ ACT 61, P.A. 1939, AS AMENDED ☐ ACT 315, P.A. 1969, AS AMENDED

APPLICATION TO (Submit 4 copies):

☒ CHANGE WELL STATUS ☒ PLUG AND ABANDON

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

CHANGE OF WELL STATUS REQUESTED FOR:

☐ PLUG BACK ☐ EXTEND PLUGGING (T.A.) ☐ PERFORATE  
☐ CONVERT TO INJECTION OR DISPOSAL WELL ☐ OTHER

☐ ACIDIZE (315 ONLY) ☐ FRACTURE (315 ONLY)

LAST PRODUCTION/INJECTION AND TYPE OF FLUID  
(Amount per day & injection pressure)

WORK TO BE DONE BY: ☐ APPROVAL MAILED

N/A

STARTING DATE

ASAP

CASING AND CEMENTING RECORD

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT TOP	PERFORATIONS
17-1/2"	13 3/8", 48#	919'	700 SX Pozmix, 200 SX Class A	Circ.	
12-1/4"	9-5/8", 43.5#	5500'	300 SX Special	4625'	
8-1/2"	5 1/2", 17#	8366'	1050 SX Pozmix, 150 SX Special C1.H	4200'	8141-44'

FORMATION RECORD (Formation and depth, oil, gas and water shows, etc.):

SEE ATTACHMENT A

GEOLOGICAL SURVEY

NOV 08 1993

Permit & Bonding Unit

DETAIL PROPOSED PROCEDURES:

SEE ATTACHMENT B

DNR ADDITIONAL REQUIREMENTS:

Notify DNR 616-775-9727 24 hours prior to start up.

NAME/SIGNATURE (Authorized Representative)

N.R. Daniels, Jr. Michigan Production Superintendent

*N.R. Daniels Jr.*

DATE

9/27/93

APPROVED BY DNR

*Michael J. Nuss*

OFFICE

CTDILLAC

APPROVAL DATE

NOV 05 1993

TERMINATION DATE

NOTE: THREE COPIES OF WELL PLUGGING OR REWORK (PR 7200-8) ARE TO BE FILED WITHIN 30 DAYS OF COMPLETION.



Michigan Department of Natural Resources  
Geological Survey Division

# RECORD OF WELL PLUGGING OR REWORK

REQUIRED BY AUTHORITY OF: ACT 61, PA 1939, as amended or ACT 315, PA 1969, as amended. Non-submission and / or falsification of this information may result in fines and / or imprisonment.

Permit Number

36110

Well Name &amp; Number

Thompson #3-36

Type of Well

Field Name

Oil Producer

Hersey

1/4 1/4 1/4, Section, Township, Range, County

NE NW SE Sec 36 T17N-R9W

Osceola, County

Date Plugging / Rework Started

11-08-93

Date Plugging / Rework Completed

12-04-93

Name and Address of Well OWNER

Marathon Oil Company  
1231 E. Mosherville Road  
Jonesville, MI 49250

Name and Address of Contractor/Service Company

(attach additional sheets as needed)

Beckman Services, Inc. 4400 N. Clare Ave. Harrison, MI 48622  
Michigan Wireline P O Box 349 Mt. Pleasant, MI 48804  
Halliburton Ser. P O Box 374 Mt. Pleasant, MI 48804

Indicate Operation &amp; Type of Well Permit

☒ PLUGGING ☐ REWORK ☒ Act 61 Oil & Gas ☐ Act 315 Mineral Wells

☐ Tools, tubing, etc. left in hole - describe in Daily Chronology.

Name of DNR employee issuing Plugging Permit or Approving Change of Well

Status. Michael J. Moss

Date issued 11-05-93

☐ Well logs run - list types and depths in Daily Chronology.

## For WELL PLUGGING Only (HOLE CONDITIONS AFTER PLUGGING)

CASING				PLUGS				
Casing Size	Where Set	Amount Casing Pulled	Depth Casing Cut/Perfed: Windows Milled	Depth		Type of Bridge or Plug	Cement Plugs: Cement type, # sx, and additives	Tagged Top? Y/N
				Bottom	Top			
13 3/8"	919'	4'	4'	8100'	7100'	Cement	50 sx Class "H"	N
9 5/8"	5500'	3997.45'	4003'	7100'	6900'	Cement	25 sx Class "H"	N
5 1/2"	8366'	4043'	4150'	5600'	5400'	Cement	25 sx Class "A"	N
				1134'	1028'	Cement	170 sx Class "A"	Y
				1028'	600'	Cement	305 sx Class "A"	N
				600'	4'	Cement	526 sx Class "A"	N

Check ☐ if NORM material was reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on back of this form.

## For WELL REWORK Only

REWORK WAS TO: ☐ TEMPORARILY ABANDON
☐ CONVERT TO: ☐ Disposal Well ☐ Production ☐ Storage ☐ Enhanced Recovery ☐ Other

☐ REMEDIAL: ☐ Perf & Test ☐ Repair Casing / Cement ☐ Redrill ☐ Other

☐ PLUGBACK: ☐ New Production Zone ☐ Disposal ☐ Storage ☐ Enhanced Recovery ☐ Other

## Well Casing Record - BEFORE Rework

Casing		Cement		Perforations			Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	if plugged, HOW?	

## Well Casing Record - AFTER Rework (Indicate additions and changes only: complete Test Record on next page)

Casing		Cement		Perforations			Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	if plugged, HOW?	

### BEFORE REWORK

Total Depth Formation / Zone Well Completed For

### AFTER REWORK

Total Depth Formation / Zone Well Completed For

[illegible]

CERTIFICATION "I state that I am authorized by said Owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
November 11, 1993

WORKOVER/RECOMPLETION

Hersey Field  
Thompson #3-36  
Osceola County, MI  
AFE NO: 98832  
AFE AMOUNT: \$48,300

OPERATOR: Marathon Oil  
RIG: Beckman #4  
MOC/WI: 77%3  
MIRU: 11-08-93

CSG: 13 3/8" 45# @ 919'  
9 5/8" 435# @ 5500'  
5 1/2" 17# @ 8366'

ELEV: GL KB  
TD: PBTD:

---

COST TO DATE: \$1,123

DAY: 1

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/08/93: MI and spot 500 bbl Frac tank, mud pump, and open top tank. Hauled in 350 bbls 10.2 SAB. Rig had flat tire on the way to the location. Waiting on tire repair in a.m.

---

COST TO DATE: \$5,697

DAY: 2

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/09/93: MIRU Beckman Rig #4. Used J&B cat to spot rig. Csg 1100 psi and tbg 0 psi. RU JO well service. Ran 2.33" OD gauge ring range to 7968'. ROH. RIH w/DD Bridge plug and set @ 300'. ROH. ND tree (All bolts very rusty). NU BOP's. RU Double check. Tested BOP's to 500 psi and 5000 psi. Tested ok. RD Double check. RIH and retrieved DD Bridge plug. ROH. RD JO well service. Secured well for night.

---

COST TO DATE: \$10,137

DAY: 3

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/10/93: Tbg 0 psi and csg 0 psi. Circulated hole w/10.2 SAB. TOH w/260 jts 2 7/8" tbg (8067'). RU Michigan Wireline. RIH w/gauger ring and junk basket to 8150' GLM. ROH. RIH w/Baker K-1 5 1/2" retainer and set @ 8100'. ROH. RD Michigan Wireline. TIH w/Baker stinger tool and 10 stands 2 7/8" tbg. SWIFN.

---



DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
November 15, 1993

WORKOVER/RECOMPLETION

Hersey Field  
Thompson #3-36  
Osceola County, MI  
AFE NO: 98832

AFE AMOUNT: \$48,300  
CSG: 13 3/8" 45# @ 919'  
9 5/8" 435# @ 5500'  
5 1/2" 17# @ 8366'

OPERATOR: Marathon Oil  
RIG: Beckman #4  
MOC/WI: 77%3  
MIRU: 11-08-93

ELEV: GL KB  
TD: PBTD:

---

COST TO DATE: \$17,917

DAY: 4

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/11/93: 0 psi on well. Finished TIH w/2 7/8" tbg. Stung into retainer @ 8100'. RU Halliburton services. Pumped 15 bbls SAB @ 3 bbl/min, 2000 psi. Pulled out of retainer and spotted cement to end of tbg. Stung back into retainer. Pumped 25 sks Class "H" cmt into formation @ 2 bbl/min, 1800 psi. Pulled out of retainer and spotted 25 sks Class "H" cmt. Flushed tbg with 45 bbls SAB. TOH with 2 7/8" tbg to 7100'. Spotted 25 sks of Class "H" cmt (7100-6900'). Flushed w/40 bbls SAB. TOH with 2 7/8" tbg to 5600'. Spotted 25 sks Class "A" cmt (5400-5600'). Flushed w/30 bbls SAB. TOH w/2 7/8" tbg to 4500'. Reverse circulated hole clean. RD Halliburton. TOH w/2 7/8" tbg and stinger. SWIFN.

---

COST TO DATE: \$24,192

DAY: 5

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/13/93: 0 psi on well. ND BOP's. Ran 5 1/2" spear, pulled 140,000 w/rig. Unable to move slips on 5 1/2". Cut 5 1/2" off 2' below slips with machine cutting. ND 5 1/2" csg spool. NU spacer spool. NU 10,000 psi BOP's. Ran spear in 5 1/2". Pulled stretch on 5 1/2" 70,000 to 95,000, had 11" stretch. Pulled 70,000 to 100,000, had 12" stretch. RU Michigan Wireline. RIH and cut 5 1/2" at 4150'. Worked csg pulling 110,000 lbs csg free. ROH and RD Michigan Wireline. TOH w/5 1/2" csg checking each jt for NORM. 50 jts (2083.99'). SWIFN.

---

COST TO DATE: \$27,092

DAY: 6

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/14/93: 0 psi on well. TOH w/20 jts 5 1/2" 17# csg. Bearing went out of rig gear box right angle drive. SD for repairs. Loaded hole w/10.2 SAB and secured well. Total 5 1/2" csg pulled 70 jts (2908.47). (About 1240' left to pull). Spotted csg jacks. Spotted 10,000 BOP's for 9 5/8". Secured location until rig repairs complete. Should be done on 11-16-93.

---

DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
November 24, 1993

WORKOVER/RECOMPLETION

Hersey Field  
Thompson #3-36  
Osceola County, MI  
AFE NO: 98832

AFE AMOUNT: \$48,300  
CSG: 13 3/8" 45# @ 919'  
9 5/8" 435# @ 5500'  
5 1/2" 17# @ 8366'

OPERATOR: Marathon Oil  
RIG: Beckman #4  
MOC/WI: 77.3%  
MIRU: 11-08-93

ELEV: GL KB  
TD: PBTB:

---

COST TO DATE: \$32,997

DAY: 7

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/22/93: 0 psi on well. Finished pulling 5 1/2" 17# csg (27 jts). Total 5 1/2" csg pulled 4042.72. Checked for NORM. All okay. ND BOP's and NU csg jacks. RU Michigan Wireline. RIH w/8 1/4" OD cutter. Set down at 2688'. Could not get beyond 2688'. ROH. NU BOP's. Secured well for night. Ordered out 8 1/2" OD csg scraper for a.m.

---

COST TO DATE: \$38,432

DAY: 8

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/23/93: 0 psi on well. TIH w/8 1/2" bit and 8 1/2" csg scraper to 4149'. Circulated hole. TOH w/2 7/8" tbq, scraper and bit. RU csg jacks and 9 5/8" spear. RU Michigan Wireline. RIH w/8 1/4" OD cutter. Pulled 220,000# w/jacks. Pipe free @ 4000'. Cut csg @ 4003'. Worked csg and it seems to be cut. ROH w/wireline. RD Michigan Wireline. 0 psi on well. NU jacks and pulled 30' 9 5/8" csg @ 115,000# w/jacks. Pulled slips and bowl out of wellhead. Set 9 5/8" csg back down. ND jacks and NU BOP's. Secured well for night.

---

DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
November 30, 1993

WORKOVER/RECOMPLETION

Hersey Field  
Thompson #3-36  
Osceola County, MI  
AFE NO: 98832

AFE AMOUNT: \$48,300  
CSG: 13 3/8" 45# @ 919'  
9 5/8" 435# @ 5500'  
5 1/2" 17# @ 8366'

OPERATOR: Marathon Oil  
RIG: Beckman #4  
MOC/WI: 77.3%  
MIRU: 11-08-93

ELEV: GL KB  
TD: PBTD:

---

COST TO DATE: \$39,692

DAY: 9

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/24/93: 0 psi on well. Rig crew stringing up six lines on rig (7 hrs). Pulled on 9 5/8" csg, pulling 230,000# w/rig. Pipe moved up hole 20'. Worked 9 5/8" pipe pulling @ 220,000#. Trouble with rig air supply to clutch. Rig only able to pull 180,000# to 200,000#. Clutch slipping. Stacked 9 5/8" csg out on bottom. Secured well. Rig crew to work on rig on 11-26-93. No charge for rig today. Will start work again on 11-29-93.

---

DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
December 02, 1993

WORKOVER/RECOMPLETION

Hersey Field  
Thompson #3-36  
Osceola County, MI  
AFE NO: 98832

AFE AMOUNT: \$48,300

CSG: 13 3/8" 45# @ 919'  
9 5/8" 435# @ 5500'  
5 1/2" 17# @ 8366'

OPERATOR: Marathon Oil  
RIG: Beckman #4  
MOC/WI: 77.3%  
MIRU: 11-08-93

ELEV: GL KB  
TD: PBSD:

---

COST TO DATE: \$43,702

DAY: 10

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/29/93: 0 psi on well. RU casing jacks. Started jacking 9 5/8" @310,000#. Jacks 8 jts out of hole. Pulled 1 jt w/rig @ 200,000#. Unable to break connection on jt #10. Worked 1 1/2 hrs. Called out welder to head collar in am. Secured well for night. Loaded hole w/10.2 brine. Took 32 bbls. Total of 9 jts 9 5/8" csg pulled today.

---

COST TO DATE: \$48,402

DAY: 11

PRESENT OPERATION: Plug and Abandon

REMARKS: 11/30/93: 0 psi on well. Loaded hole w/10.2 SAB. Took 25 bbls. Attempted to pull 9 5/8" csg w/rig. Pulled 230,000# with no luck. Jacked out 1 jt 9 5/8" csg pulling 300,000#. Pulled 5 jts with rig @ 180,000#. RD csg jacks. Finished pulling 9 5/8" csg. Loaded hole w/10.2 SAB after each jt. Checked all pipe for NORM. All okay. Total pipe pulled today 94 jts. Total pipe pulled 103 jts and 2 stubs (3997.45). Shut well in for night.

---

COST TO DATE: \$51,962

DAY: 12

PRESENT OPERATION: Plug and Abandon

REMARKS: 12/01/93: 0 psi on well. Loaded hole w/10.2 SAB. Took 22 bbls. TIH with 2 7/8" tbg (open ended). Tbg stopped @1266'. Worked tbg, but could not get through @1266'. RU mud pump and circulated hole w/10.2 bbls brine. Still unable to get through @ 1266'. RU Halliburton. Circulated hole w/50 Vis Gel (wt 10.1). Dropped through @ 1266'. Ran 3 jts tbg and set down again @1357'. Soft tbg drifting down slow. TOH w/2 7/8" tbg. Bottom of tbg @900'. Secured well for night.

---

DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
December 06, 1993

WORKOVER/RECOMPLETION

Hersey Field  
Thompson #3-36  
Osceola County, MI  
AFE NO: 98832  
AFE AMOUNT: \$48,300  
CSG: 13 3/8" 45# @ 919'  
9 5/8" 435# @ 5500'  
5 1/2" 17# @ 8366'

OPERATOR: Marathon Oil  
RIG: Beckman #4  
MOC/WI: 77.3%  
MIRU: 11-08-93

ELEV: GL KB  
TD: PBTB:

---

COST TO DATE: \$59,404

DAY: 13

PRESENT OPERATION: Plug and Abandon

Remarks: 12/02/93: Well 0 psi. TIH w/2 7/8" tbg and tagged at 1086' (180' higher than yesterday). RU Halliburton. Reverse circulated hole clean. Getting back chunks of shale. Circulated down 30', pulled up hole, and could not get back down. Tbg plugged. RD Halliburton. TOH w/2 7/8" tbg. RU Kal-Fish drill mobile. Started mixing salt water gel to 45 Vis. TIH w/7 5/8" bit and 2 7/8" tbg and tagged at 1080'. Drilled down to 1115' again (10 min) and circulated hole 30 minutes. Short trip again. Lost 5' of hole. Reamed at 1110' - 1115' for one hour. Short trip again. (No hole loss). Picked up jt w/swivel and drilled from 1115' to 1128' for 10 minutes. Drilled hard from 1128' to 1134'. Drilled down to 1143'. Circulated hole 30 minutes. Added mud and took Vis to 50. Short trip at 1115' - 1143' (lost 10' of hole). Drilled down from 1133' - 1143' in 35 minutes. Circulated hole for 30 minutes. Present conditions: pump rate 4 bbls/min, mud wt 10.3, 48 Vis, and pump pressure 450 psi. Bit RPM 100. RU Halliburton services and kicked pump rate up to 7 bbls/min.

---

COST TO DATE: \$77,799

DAY: 14

PRESENT OPERATION: Plug and Abandon

Remarks: 12/03/93: Drilled at 1133' to 1143'. Kept losing last 10' of hole. Halliburton pumping at 7 bbls/min. Mud wt 10.2 and 48 Vis. 09:00 hrs called Mike Moss with the DNR. Okay to plug well from 1134' to surface. RD Kalfish and RD Halliburton. TOH w/2 7/8" tbg and 7 7/8" rock tooth bit. Layed down 60 jts tbg from derrick. TIH w/2 7/8" tbg open ended to 1100'. RU Halliburton. Tbg plugged. Pressure up to 1000 psi on tbg. Shook tbg, but could not unplug tbg. TOH w/2 7/8" tbg (last jt plugged). TIH w/2 7/8" tbg to 1091'. Circulated hole. Circulated down to 1122'. Mixed and pumped 170 sks Class "A" cmt. TOH w/2 7/8" tbg to 1028'. Mixed and pumped 305 sks Class "A" cmt 1028' to 600'. Pulled 2 7/8" tbg to 600'. Mixed and pumped 526 sks Class "A" cmt. Cemented to surface. RD Halliburton. ND BOP's and cut 13 3/8" off 5' below ground. Welded plate on top. SDFN.

---

DAILY REPORT  
CENTRAL PRODUCTION REGION  
COMPANY OPERATED  
December 06, 1993

WORKOVER/RECOMPLETION

Hersey Field

Thompson #3-36

Osceola County, MI

AFE NO: 98832

AFE AMOUNT: \$48,300

CSG: 13 3/8" 45# @ 919'

9 5/8" 435# @ 5500'

5 1/2" 17# @ 8366'

OPERATOR: Marathon Oil

RIG: Beckman #4

MOC/WI: 77.3%

MIRU: 11-08-93

ELEV: GL KB

TD: PBTD:

---

COST TO DATE: \$81,399

DAY: 15

PRESENT OPERATION: Plug and Abandon

REMARKS: 12/04/93: RD Beckman Rig #4. Dug up seller and filled hole w/sand. Hauled all equipment off location except for 500 bbl Frac tank. Job complete.

---

NOV 05 1993

THOMPSON 3-36  
Section 36-T17N-R9W  
Osceola County, Michigan

P & A PROCEDURE

WELL DATA:

13-3/8" 48# csg @ 919'	Cement to surface
9-5/8" 43.5# csg @ 5500'	TOC = 4625'
5-1/2" 17# csg @ 8366'	TOC = 4200'
2-7/8" 6.5# tbg @ 8095'	
Existing perfs @ 8141-44'	

PROCEDURE:

1. Kill well with 10.2 ppg SAB (State Approved Brine). ND tree. NU BOP's.
2. TOH with 2-7/8" tubing.
3. RU wireline company. Run gauge ring and junk basket to 8100'.  
Set cement retainer @ 8100'. TIH with tubing and string into cement retainer. Establish injection and pump 50 sx of Class "H" cement. Displace 25 sx into formation, pull out of cement retainer and spot 25 sx above retainer. TOH to 7100' and reverse circulate to clean tubing.
4. With tubing at 7100', spot a 25 sx Class "H" cement plug at 7100-6900' (Across top of A2 Carbonate @ 7041'). TOH to 5600' and reverse circulate to clean tubing.
5. With tubing at 5600', spot a 25 sx Class "A" cement plug at 5600-5400' (Across 9-5/8" csg shoe @ 5500'). TOH to 4500' and reverse circulate to clean tubing. TOH with tubing.
6. RU wireline company. Cut 5-1/2" casing at 4150'. TOH with 5-1/2" casing. (Monitor for NORM and follow casing handling guidelines if NORM is encountered.)
7. Cut 9-5/8" casing at 4125'. TOH with 9-5/8" casing. (Again, monitor for NORM and follow NORM guidelines.)
8. TIH with 2-7/8" tubing to top of 5-1/2" casing stub. Spot a 175 sx Class "A" cement plug at 4150-3900' (Across top of Dundee at 3948'). TOH to 3400' and reverse circulate to clean tubing. TIH to top of cement. Add Bentonite to SAB until funnel viscosity is 28-29. Circulate hole with mud. TOH to 3400'.
9. With tubing at 3400', spot a 150 sx Class "A" cement plug at 3400-3200' (Across top to Traverse at 3303'). TOH to 1650' and reverse circulate to clean tubing.



10. With tubing at 1650', spot a 150 sx Class "A" cement plug at 1650-1450' (Across top os Stray at 1614'). TOH to 1020' and reverse circulate to clean tubing.
11. With tubing at 1020', spot a 150 sx Class "A" cement plug at 1020-820' (Across 13-3/8" csg shoe at 919'). TOH with 2-7/8" tubing.
12. Spot a 25 sx Class "A" cement plug at 30' - surface. Cut casing off 4' below ground level. Weld marker plate over top of casing.

---

C. A. Paulson

---

P. E. Legg

*NRD 9/27/93*

---

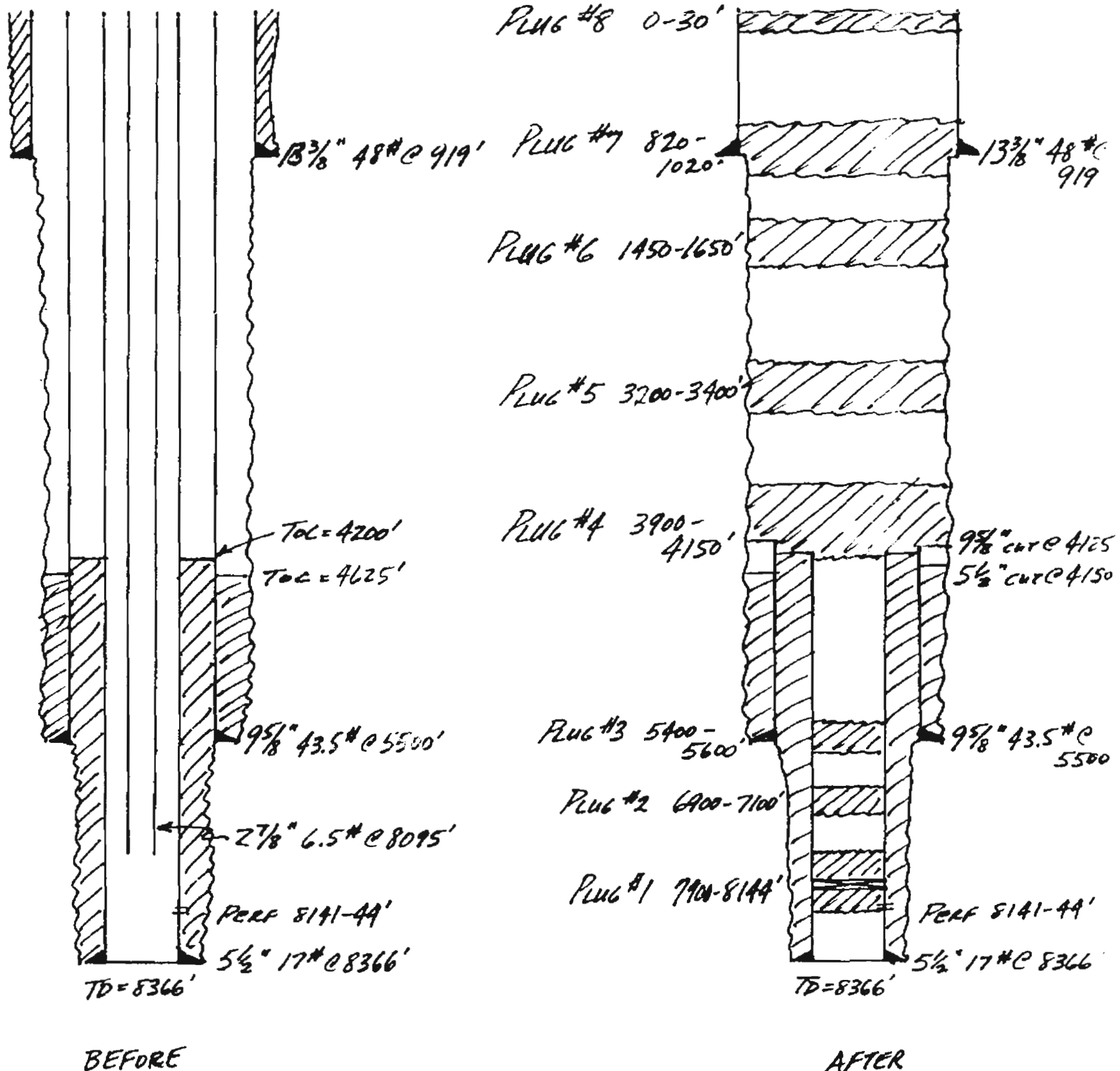
N. R. Daniels, Jr.

# MARATHON OIL COMPANY

## ENGINEERING CHART

SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 FILE \_\_\_\_\_  
 APPN \_\_\_\_\_  
 DATE 9-22-93  
 BY CA/Hulson

SUBJECT THOMPSON 3-36 (P: A)  
36-T17N-R9W OSCOLA Co, MI



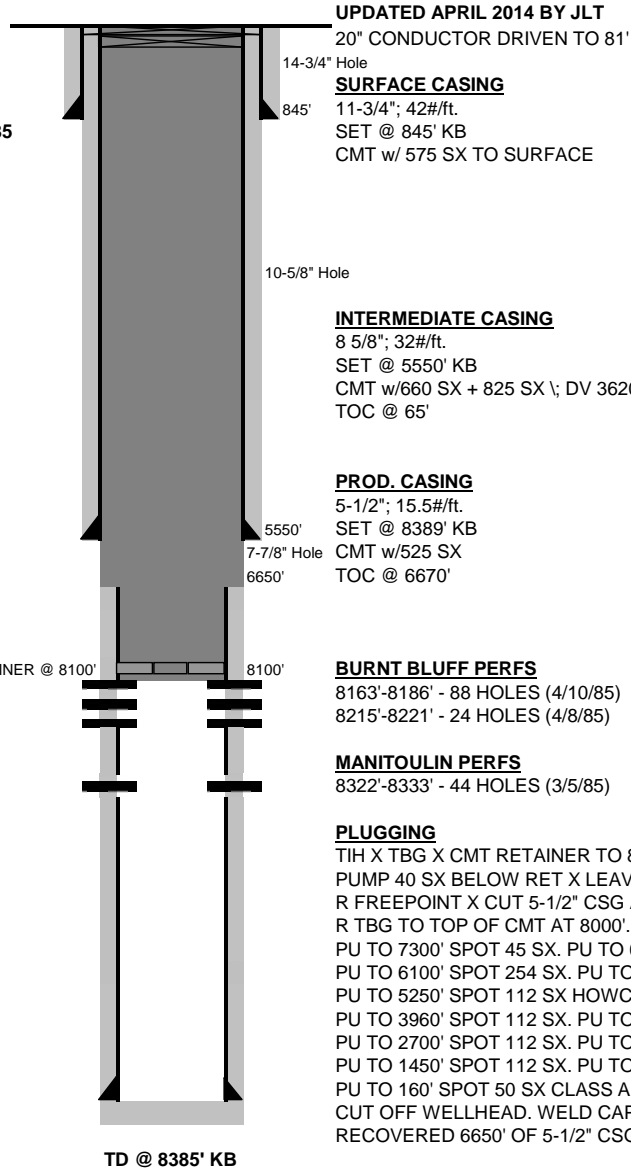
CAPACITIES	FT <sup>3</sup> /FT
13 3/8" 48# CSG	.8817
12 1/4" HOLE	.8125
9 5/8" 43.5# CSG	.4180
5 1/2" 17# CSG	.1305
2 7/8" 6.5# TDB	.0325





**VUKIN UNIT A 1-19**  
**SW SW SE Sec 19 T17N R8W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

API No. 21-133-38463-0000  
 GL @ 1104.4'  
 KB @ 1120.4'  
 WELL COMPLETION DATE: 2/1/85  
 PLUGGING COMPLETION DATE: 4/29/85



**VUKIN UNIT A 1-19 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
1/8/1985	SPUD.
3/5/1985	PERFORATED 44 HOLES: 8322'-8333'
4/8/1985	PERFORATED 24 HOLES: 8215'-8221'
4/10/1985	PERFORATED 88 HOLES: 8163'-8186'
2/1/1985	WELL COMPLETED. FORMATION AT TD CINCINNATIAN. 20" CONDUCTOR SET AT 81' 11-3/4" SET AT 845'; 575 SX 8-5/8" SET AT 5550'; 660/825 SX 5-1/2" SET AT 8389'; 525 SX
4/22/1985	PLUGGING STARTED TIH X TBG X CMT RETAINER TO 8100 FT MIX 50 SX CMT X SQUEEZE PERFS. PUMP 40 SX BELOW RET X LEAVE 10 SX ON TOP R FREEPOINT X CUT 5-1/2" CSG AT 6650'. TOH X LD 83 JTS OF 5-1/2" CSG R TBG TO TOP OF CMT AT 8000'. SPOT 45 SX HOWCO LITE PU TO 7300' SPOT 45 SX. PU TO 6600' SPOT 254 SX PU TO 6100' SPOT 254 SX. PU TO 5600' SPOT 100 SX CLASS A PU TO 5250' SPOT 112 SX HOWCO LITE. PU TO 4606' SPOT 112 SX PU TO 3960' SPOT 112 SX. PU TO 3350' SPOT 112 SX PU TO 2700' SPOT 112 SX. PU TO 2060' SPOT 112 SX HOWCO LITE PU TO 1450' SPOT 112 SX. PU TO 810' SPOT 105 SX PU TO 160' SPOT 50 SX CLASS A CUT OFF WELLHEAD. WELD CAP ON 8-5/8" X 11-3/4" RECOVERED 6650' OF 5-1/2" CSG
4/29/1985	PLUGGING COMPLETED

MAY 13 1985

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

PERMIT NUMBER

38463

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Amoco Production Company P. O. Box 1350 Traverse City, MI 49685				NAME & ADDRESS OF DRILLING CONTRACTOR(S) Indril P. O. Box 668 Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Vukin Unit A 1-19						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION SW/4 SW/4 SE/4		SECTION 19		TOWNSHIP 17N		RANGE 8W	
FOOTAGES (North/South) 330 Ft. from South		LINE AND 460		FOOTAGES (East/West) Ft. from West		COUNTY NAME Osceola	
SUBSURFACE LOCATION		SECTION		TOWNSHIP		RANGE	
FOOTAGES (North/South)		LINE AND		FOOTAGES (East/West)		COUNTY NAME	
DRILLING BEGUN 1-8-85		TOTAL DEPTH OF WELL Driller 8385 Log 8386		TYPE WELL Dryhole		ELEVATIONS	
DRILLING COMPLETED 2-1-85		FORMATION AT T.D. Cincinnatian		FT. DRLD. - ROTARY TOOLS From 0 To TD		K.B. 1120.4 R.F. 1119.6	
WELL COMPLETED 2-1-85		PRODUCING FORMATION(S) Dryhole		FT. DRLD. - CABLE TOOLS From To		R.T. Grd. 1104.4	

## CASING, CASING LINERS AND CEMENTING

## PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
20"	81'	Driven					YES	NO
11-3/4"	845'	575 sx		3/5/85	44	8322-8333	X	
8-5/8"	5550'	660/825 sx		4/8/85	24	8215-8221	X	
5-1/2"	8389'	525 sx		4/10/85	88	8163-8186	X	

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				SEE ATTACHED								

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
3/8/85	8322-8333	2250 gal 28% NEHCL	Dundee		X	3863	Minimal Amt.
4/10/85	8163-8186	500 gal 28% NEHCL					Est 100 Bbl
4/11/85	8163-8186	2000 gal 28% NEHCL					

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	CNL/LDT	5550-100			SEE ATTACHED				
Birdwell		CNL/LDT	8383-5548							
		DLL/MLL	5550-5540							
		DLL/MLL	8358-5548							

BHC/Sonic 5546-817 Dipmeter 8345-7020  
BHC/Sonic 8330-5548 PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH
DryHole						

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
5/8/85	J. L. Krupka, District Manager	<i>J. L. Krupka</i>

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

MAY 14 1985

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

## PERMIT TO PLUG AND ABANDON

38463

FIELD NAME  
Hersey Clinton

NAME AND ADDRESS OF PERMITTEE

Amoco Prod. Co.

LEASE NAME AND WELL NO

Vukin Unit #1-19

SECTION

19

117N 8W

Ewart

TOWNSHIP

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

dry hole

DATE COMPLETED

drilg. 1/31/85

DATE PLUGGING WILL START

4/19/85

PLUGGING PERMIT REQUESTED BY &amp; DATE

Mike Kutas 4/17/85

LAST PRODUCTION

perf 8163-86; only water; "puff" of gas

PLUGGING TO BE DONE BY

Pool / Halliburton

BOD

OWN

MCEGPD

DATE

PERMIT MAILED TO

COPIES MAILED TO

## CASING AND CEMENTING RECORD

HOLE DIA	CASING DIA & WT/FT	DEPTH SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT TOP	PERFORATIONS
10-5/8"	20"	80'	DP		
7-7/8"	11-3/4"	845'	650	circled	
	8-5/8"	5550'	660 1st stage; 825 2nd stage DV	3620	65
	5-1/2"	8389'	525	6670	8163-86; 8215-21

WELL FIRST PERFD  
3/5/85

## GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

KB 1120.4

BOD 545

BI 5445

BN 7995

GN 8009

CL 8095

BRT BLF 8165

MAN 8302

TD 8389

Perfs: 8322-33 squeezed w/4 bbls. cmt.  
Rtnr. at 8289'.

## PLUGGING REQUIREMENTS\*

\*Plugging requirements outlined are to be executed in accordance with the provisions of Act 81, P.A. 1939, as amended, and rules and orders adopted thereunder.

Set 5-1/2" cmt. retainer at 8100'; squeeze 40 sx Cl H cmt. Spot 10 sx on top rtnr. Cut and pull 5-1/2" csg. at 6670'+. RIH w/tubg. to stub. Spot continuous cmt. plugs using lite poz., stub to just below surf. Spot 50 sx Cl A cmt. at surf. Cut csqs. 3' below grade. Weld on 1/2" steel plate. Fill cellar, rat & mouse holes solidly to surf.

\*NOTE: BONDS CANNOT BE  
PLUGGED ACCORDING TO R  
with in accordance with /SARIED UNTIL A PLUGGING IS COMPLETED. CELLAR RAT HOLE AND PITS FILLED. WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE  
188 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public  
53, P.A. 1974 G.L. 460 701 to 460 718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

OFFICE

Cadillac D#6

DATE

5/3/85

NOTE: WELL PLUGGING RECORD Form R-7223 to be filed in triplicate within 30 days after completion

R-7223  
Rev. 11/77



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

CADILLAC HAS COPY

MAY 16 1985

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER

38463

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

Amoco Production Company, P. O. Box 1350, Traverse City, MI 49685

COMPLETE LEASE OR FARM NAME(S)

Vukin Unit A

WELL NUMBER

1-19

WELL LOCATION

SW 1/4 SW 1/4 SE 1/4 SEC. 19 T. 17N R. 8W

TOWNSHIP

Evart

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dryhole

TOTAL DEPTH

8386

FORMATION

Cincinnatian

DATE PLUGGING STARTED

4/22/85

DATE PLUGGING COMPLETED

4/29/85

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Not Available

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
20"	81'		
11-3/4"	845'		
8-5/8"	5550'		
5-1/2"	8389'	6650'	

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Numerous Cement Plugs		
See details described below		

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton - Kalkaska

Was the well plugged by a Company or Contractor other than Owner or Operator?

☒ YES ☐ NO

If yes, give name and address:

Halliburton - Kalkaska

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

R. A. Abrahamson - Amoco

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

1. TIH X TBG X CMT RETAINER TO 8100 Ft.
2. MIX 50 SX CMT X SQUEEZE PERFS. PUMP 40 SX BELOW RET X LEAVE 10 SX ON TOP.
3. R FREEPOINT X CUT 5-1/2" CSG AT 6650'. TOH X LD 83 JTS OF 5-1/2" CSG.
4. R TBG TO TOP OF CMT AT 8000 FT. SPOT 45 SX HOWCO LITE.
5. PU TO 7300 FT. SPOT 45 SX. PU TO 6600 Ft. SPOT 254 SX.
6. PU TO 6100 FT. SPOT 254 SX. PU TO 5600 FT. SPOT 100 SX CLASS A.
7. PU TO 5250 FT. SPOT 112 SX HOWCO LITE. PU TO 4606 FT. SPOT 112 SX.
8. PU TO 3960 FT. SPOT 112 SX. PU TO 3350 FT. SPOT 112 SX.
9. PU TO 2700 FT. SPOT 112 SX. PU TO 2060 FT. SPOT 112 SX HOWCO LITE.
10. PU TO 1450 FT. SPOT 112 SX. PU TO 810', SPOT 105 SX.
11. PU TO 160 FT. SPOT 50 SX CLASS A.
12. CUT OFF WELLHEAD. WELD CAP ON 8-5/8" X 11-3/4".

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

J. L. Krupka, District Manager

COMPANY NAME AND ADDRESS

Amoco Production Company  
P. O. Box 1350  
Traverse City, MI 49685

SIGNATURE

DATE (Month, Day, Year)

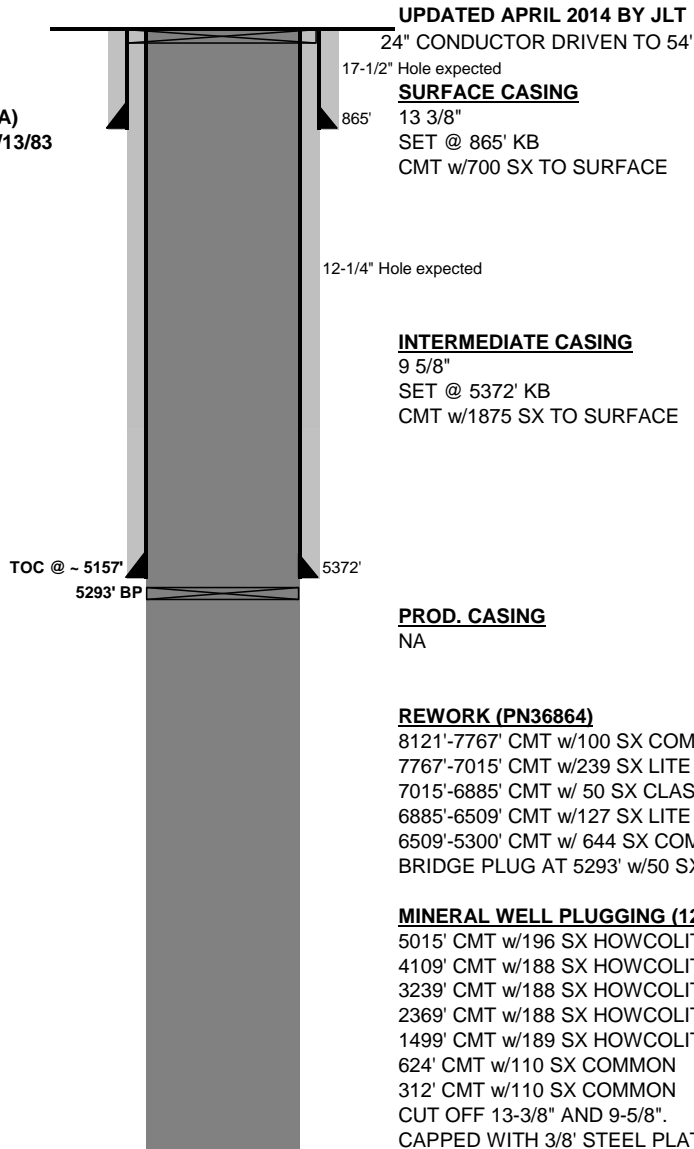
5/8/85





**WARD 1-11**  
**C NE NE Sec 11 T16N R9W**  
**MECOSTA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

API No. 21-107-36864-0000  
GL @ 1140'  
KB @ 1154.2'  
COMPLETION DATE: DRY HOLE (NA)  
PLUGGING COMPLETION DATE: 9/13/83



TD @ 8121' KB

**WARD 1-11 WELL HISTORY**

<b><u>DATE</u></b>	<b><u>DESCRIPTION</u></b>
7/28/1983	SPUD.
9/11/1983	DRILLING COMPLETED. FORMATION COMPLETED IN CININNATION. 24" CONDUCTOR SET AT 54' 13 3/8" SET AT 865'; 700 SX 9 5/8" SET AT 5372'; 1875 SX
9/12/1983	REWORK START DATE (PN36864) RAN IN AND SET 110 SX FROM 8121' TO 7767'. PULLED UP AND SPOTTED 239 SX FROM 7767'-7015'. SPOTTED 50 SX FROM 7015'-6885'. PULLED UP AND SPOTTED 127 SX FROM 6885'-6509' PULLED UP AND SPOTTED 644 SX FROM 6509'-5300'. SET BRIDGE PLUG AT 5293' AND SPOTTED 50 SX ON TOP (TOC @ ~5157')
9/13/1983	REWORK COMPLETED (PN36864).
9/12/1983	PLUGGING START DATE (1200-821-354) RAN IN WITH 2-7/8" TUBING, TAGGED CEMENT AT 5018'. CIRCULATED OUT MUD, HALLIBURTON SPOTTED HOWCOLITE PLUGS: 5015' CMT w/196 SX HOWCOLITE 4109' CMT w/188 SX HOWCOLITE 3239' CMT w/188 SX HOWCOLITE 2369' CMT w/188 SX HOWCOLITE 1499' CMT w/189 SX HOWCOLITE 624' CMT w/110 SX COMMON 312' CMT w/110 SX COMMON CUT OFF 13-3/8" AND 9-5/8". CAPPED WITH 3/8" STEEL PLATE
9/13/1983	PLUGGING COMPLETED (1200-821-354)

NOV 03 1983

## LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)

Submit in DUPLICATE Within 30 Days after Well Completion

PERMIT NUMBER

36864

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG Oil & Gas Co., Inc. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) Bigard Drilling Company 1315 S. Mission Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Ward #1-11				DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>			
SURFACE LOCATION C NE SE		SECTION 11	TOWNSHIP 16N	RANGE 9W	TOWNSHIP NAME Grant		
FOOTAGES (North/South) 630 Ft. from North		Line and 617		Ft. from East		COUNTY NAME Mecosta	
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		Line and		Ft. from		COUNTY NAME	
Line of quarter section							
DATE	DRILLING BEGUN 7-28-83	TOTAL DEPTH OF WELL Driller 8121 Log 8130		TYPE WELL Dry Hole		ELEVATIONS	
	DRILLING COMPLETED 9-11-83	FORMATION AT T.D. Cincinnatian		FT. DRLD. - ROTARY TOOLS From 0 To 8130			K.B. 1154.2
	WELL COMPLETED	PRODUCING FORMATION(S) None		FT. DRLD. - CABLE TOOLS From To			R.F. 1152.3
						R.T. Grd. 1140.2	

## CASING, CASING LINERS AND CEMENTING

## PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
24"	54'						YES	NO
13 3/8"	865'	700 Sx				None		
9 5/8"	1875 Sx							

## GROSS PAY INTERVALS

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
None							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Burnt Bluff	Gas	7960					X	
				A2 Carbonate	Gas	6910	X	X			X	
				Antrim	Gas	3150					X	

## STIMULATION BY ACID OR FRACTURING

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	None		None				

## MECHANICAL LOGS, LIST EACH TYPE RUN

## DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	XX	LDT-CNL-GR	200-8130			1700	1/2°			
Birdwell		DLL-MLL	2900-8130			4500	1 1/2°			
		NGT	200-8130			6060	1/2°			
		BHC-Sonic	200-8130			7320	1°			

## PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
10-17-83	William E. Barker, Geologist	William E. Barker

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R 7210  
Rev. 3/77

DEPARTMENT OF NATURAL RESOURCES  
Geological Survey Division

REQUEST FOR CHANGE OF OWNERSHIP OF A PERMIT  
(Submit all copies)

Please Change:

Permit No. 36864 Type Well Oil & Gas Field Name Exploratory  
~~Hersey-Evart~~

Owned by PPG Oil & Gas Co., Inc.

Address 2258 Enterprise Drive, Mt. Pleasant, MI 48858 (517) 773-3949  
(street) (town) (state) (zip) (phone)

for Ward No. 1-11 located in the C 1/4 NE 1/4 SE 1/4

section 11, T. 16N, R. 9W, Grant Township, Mecosta County,

to PPG Industries, Inc.

(acquiring owner-complete names please)

All operating rights are discharged by (us) (me).

(Owner)

(Representative)

(Signature)

(Date)

PPG Oil & Gas Co., Inc.-Donald D. Metzger

Donald D. Metzger 4-17-84

THE SUPERVISOR IS PROHIBITED BY STATUTE FROM ISSUING A PERMIT TO ANY PERSON WHO IS NOT IN COMPLIANCE WITH THE PROVISIONS OF THE ACT, THE RULES, OR THE ORDERS OF EITHER THE SUPERVISOR OR THE NATURAL RESOURCES COMMISSION. ELIGIBILITY FOR PERMITS IS CONDITIONED ON COMPLIANCE WITH SUCH RULES AND ORDERS IN A DILIGENT MANNER AND IN ACCORDANCE WITH ACCEPTED OIL FIELD PRACTICE.

(We) (I) have acquired the well under this permit and assume full responsibility for drilling, operation, and abandonment in conformity with the law, regulations and orders issued by the Supervisor of Wells. The bond(s) required is attached or already on file.

PPG Industries, Inc.

(acquiring owner-complete names please)

Address 2258 Enterprise Drive, Mt. Pleasant, MI 48858 (517) 773-3949  
(street) (town) (state) (zip) (phone)

All operating rights and responsibilities are assumed by (us) (me).

(Owner)

(Representative)

(Signature)

(Date)

PPG Industries, Inc. - Donald D. Metzger

Donald D. Metzger 4-17-84

THE DEPARTMENT OF NATURAL RESOURCES

Approved.

Stephen J. Szymanski 4/20/84  
(Signature) (Date)

DNR USE ONLY

White, Lansing  
Yellow, Acquiring Owner  
Pink, Selling Owner  
Blue, Field

R-7214 (Rev. 10-79)

## JOB LOG

WELL NO. 1-11 LEASE Ward

TICKET NO. 582870

CUSTOMER PPG Oil &amp; Gas

PAGE NO. 1 of 2

JOB TYPE P+A

DATE 9/12/83

FORM 2013 R-2

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS
				T	DP	TUBING	CASING	
					DP			Shower on loc.
								Safety meeting & set-up
1			0	1				1st plug @ 8121' to 7748' 110 sho
1			25	1				Start FW ahead
1			0	1				Finish FW ahead
1			23.2	1				Start mixing Cmt (CIA)
1			7.0	1				Finish Mixing Cmt (CIA)
1			0	1				FW Behind
1			103.0	1				Start Disp w/ Mud
1				1				Finish Disp w/ Mud
1			0	1				2nd plug @ 7767' to 7015'
1			10	1				Start FW ahead
1			0	1				Finish FW ahead
1			83.9	1				Start mixing Cmt (lite)
1			2.8	1				Finish mixing Cmt (lite)
1			0	1				FW Behind
1			96.9	1				Start Disp w/ Mud
1				1				Finish Disp w/ Mud
1			0	1				3rd plug @ 7015 to 6885'
1			10	1				Start FW ahead
1			0	1				Finish FW ahead
1			10.5	1				Start mixing Cmt (CIA)
1			2.8	1				Finish mixing Cmt (CIA)
1			0	1				FW Behind
1			95.1	1				Start Disp w/ Mud
1				1				Finish Disp w/ Mud
1			0	1				4th plug @ 6885' to 6509'
1			10	1				FW ahead
1			0	1				Finish FW ahead
1			44.6	1				Mix Cmt - lite
1			2.8	1				Finish Cmt
1				1				FW Behind

Cont. on next page



## JOB LOG

WELL NO.

1-11

LEASE

Wood

TICKET NO.

582870

CUSTOMER

PPG Oil &amp; Gas

PAGE NO.

2 of 2

JOB TYPE

P+A

DATE

4/12/83

FORM 2812 R-2

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS
				T	DP	TUBING	CASING	
					DP			Cont From 1st page 4th plug
								Start Disp w/ Mud
								Finish Disp w/ Mud
1				1				5th plug @ 6509' to 5300'
1			0	1				Start FW ahead
1			10	1				Finish FW ahead
1			0	1				Start Cmt (CIA)
1			135.3	1				Finish Cmt (CIA)
1			2.8	1				FW Behind
1			0	1				Start Disp w/ Mud
1			72.6	1				Finish Disp w/ Mud
2			25	1				BREAK Circulation
			0					START FW AHEAD
2			15	1				FW F.W. AHEAD
			0					START LAST Plug 5070' Cmt
2			10.5	1				Finish Plug
			0					FW Spacers START
2			3.5	1				FW Spacers Finish
			0					START Disp w/ Mud
2			69	1				Finish Disp w/ Mud
								Release Psi
								Lines Released.

CUSTOMER

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

NOV 07 1983

LANSING HAS COPY

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER

36864

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc., 2258 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

Ward

WELL NUMBER

1-11

WELL LOCATION

C ¼ NE ¼ SE ¼ SEC. 11 T. 16N R. 9W

TOWNSHIP

Grant

COUNTY

Mecosta

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole

TOTAL DEPTH

8130

FORMATION

Cincinnatian

DATE PLUGGING STARTED

9-12-83

DATE PLUGGING COMPLETED

9-13-83

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Todd

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	54'		
13 3/8"	865'		
9 5/8"	5372'		

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	8121-7767	100 Sx Common
Cement	7767-7015	239 Sx Lite
Cement	7015-6885	50 Sx Class A
Cement	6885-6509	127 Sx Lite
Cement	6509-5300	644 Sx Common
Bridge Plug	5293	50 Sx on Top

TX ≈ 5157'

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging: Chet Lowery

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Ran in and set 110 sx from 8121 to 7767, pulled up and spotted 239 sx from 7767 to 7015, pulled up and spotted 50 sx from 7015-6885, pulled up and spotted 127 sx from 6885 to 6509, pulled up and spotted 644 sx from 6509 to 5300. Set bridge plug at 5293 and spotted 50 sx on top.

GEOLOGICAL SURVEY

OCT 15 1993

Permit & Bonding Unit

GEOLOGICAL SURVEY  
NOV 3 1983

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William E. Booker, Geologist

COMPANY NAME AND ADDRESS

STRICKLER GEOLOGICAL SERVICES, INC.

SIGNATURE

William E. Booker

DATE (Month, Day, Year)

10-17-83

1425 S. Mission

Mt. Pleasant, MI 48858

OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

Supplemental Plugging Data and Site Conditions:

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

SIGNATURE

## DIVISION

DATE \_\_\_\_\_

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

MINERAL WELL PLUGGING RECORD

File in DUPLICATE Within 30 Days After Plugging is Completed

36864 Act 61

PERMIT NUMBER

1200-821-354

DATE

2-1-88

GEOLOGICAL

Permits & Bonding

COUNTY  
Macosta

UNIT

OWNER OR OPERATOR

PPG Industries, Inc.

ADDRESS

One PPG Place, Pittsburgh, PA 15272

WELL NAME

Ward

WELL NUMBER

1-11

WELL LOCATION

C 1/4 NE 1/4 SE 1/4 SEC. 11 T. 16N R. 9W

TOWNSHIP

Grant

COUNTY

Macosta

TYPE OF WELL (Brine, Disposal, Storage, or Test)

Dry Hole

TOTAL DEPTH

8130

FORMATION

Cincinnatian

DATE PLUGGING STARTED

9-12-83

DATE PLUGGING COMPLETED

9-13-83

WAS PERMISSION OF DEPT. OF NATURAL RESOURCES  
OBTAINED BEFORE PLUGGING BEGAN?

☒ YES

☐ NO

NAME OF DEPARTMENT REPRESENTATIVE WHO AUTHORIZED OR SUPERVISED PLUGGING

CASING SIZE	WHERE SET	AMOUNT RECOVERED	SHOT OR RIPPED	TYPE OF BRIDGES OR PLUGS	DEPTH PLACED	NUMBER SACKS
24"	54'			Cement (Howcolite)	5015'	196 sx
13 3/8"	865'			Cement ( " )	4109'	188 sx
9 5/8"	5372'			Cement ( " )	3239'	188 sx
				Cement ( " )	2369'	188 sx
				Cement ( " )	1499'	189 sx
				Cement (common)	624'	110 sx
				Cement ( " )	312'	110 sx

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Ran in with 2 7/8" tubing, tagged cement at 5018',  
circulated out mud, Halliburton spotted Howcolite plugs: 196 sx at 5015',  
188 sx at 4109', 188 sx at 3239', 188 sx at 2369', and 189 sx at 1499'.  
Halliburton spotted 110 sx common cement at 624' and 110 sx common cement at  
312'. Cut off 13 3/8" and 9 5/8". Capped with 3/8" steel plate.

(USE REVERSE SIDE IF NEEDED)

Were tools, tubing, casing, etc., lost or left  
in the hole before or during plugging?

☐ YES

☒ NO

If yes, give details:

Did a Service Company pump mud,  
spot cement, or set bridge plugs?

☒ YES

☐ NO

If yes, give name and address:

Halliburton, Mt. Pleasant, MI

Was the well plugged by a Company or  
Contractor other than Owner or Operator?

☐ YES

☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging

CERTIFICATE

of Kalium Chemicals

(company)

I, Donald D. Metzger, state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction and that the facts stated herein are true, correct and complete to the best of my knowledge.

SIGNATURE

ADDRESS

TITLE

11126 140th Ave., Hersey, MI Resident Manager

FINAL INSPECTIONS

DEPARTMENT REPRESENTATIVE

DATE

DEPARTMENT REPRESENTATIVE

DATE

OPERATORS USE

DEPARTMENT USE ONLY

Supplemental Plugging Data and Site Conditions:



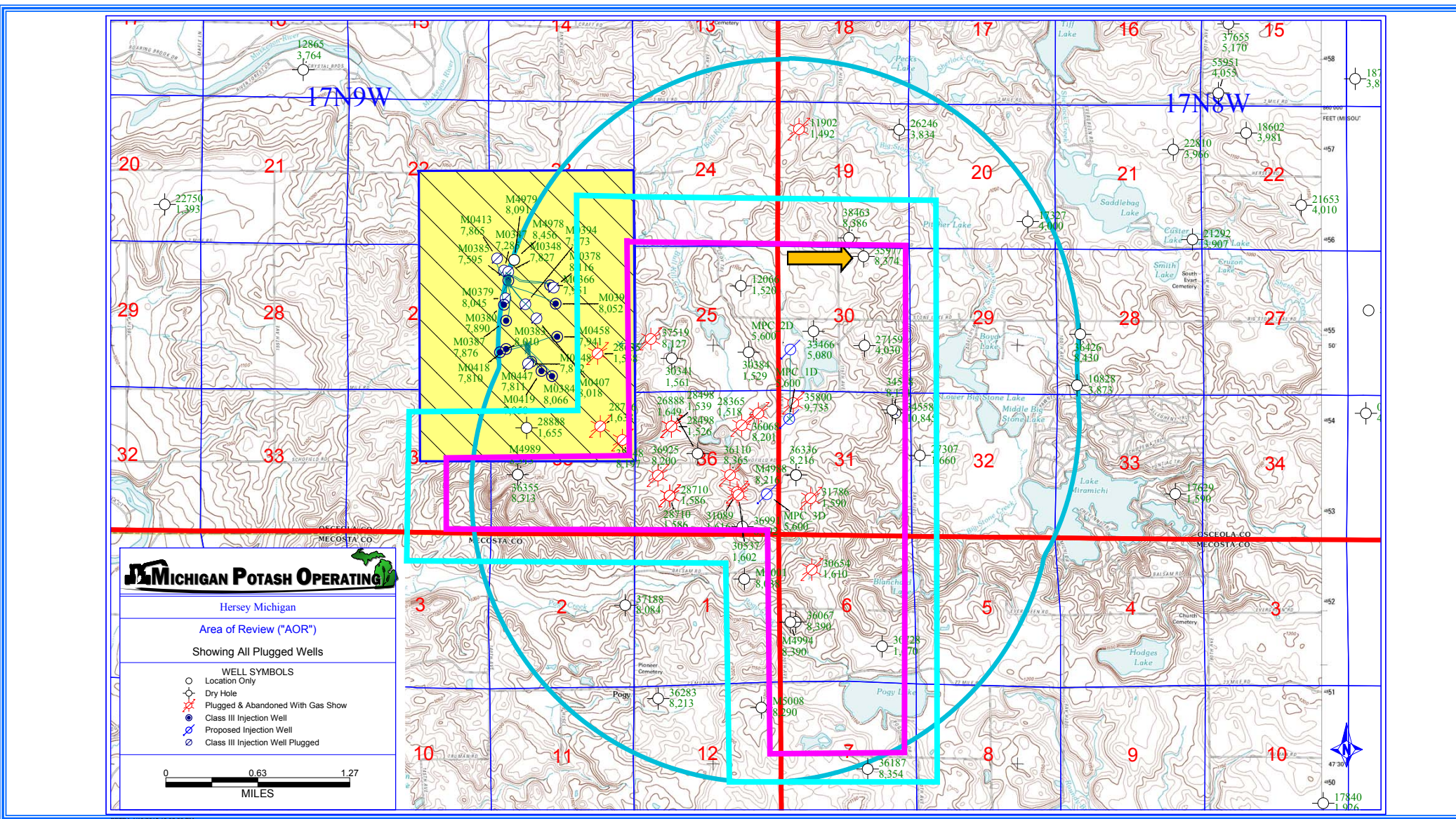
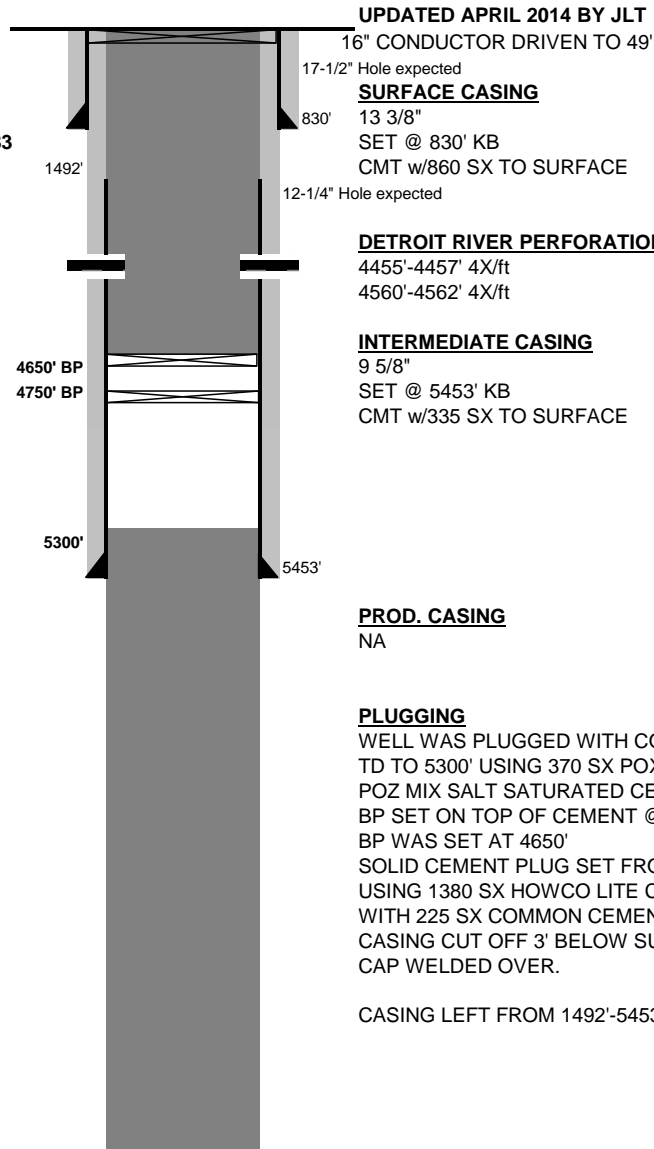


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**WARK 1-30**  
**NE NW NE Sec 30 T17N R8W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

API No. 21-133-35977-0000  
GL @ 1100'  
KB @ 1116.2'  
COMPLETION DATE: DRY HOLE (NA)  
PLUGGING COMPLETION DATE: 9/13/83



UPDATED APRIL 2014 BY JLT

16" CONDUCTOR DRIVEN TO 49'

17-1/2" Hole expected

**SURFACE CASING**

13 3/8"

SET @ 830' KB

CMT w/860 SX TO SURFACE

12-1/4" Hole expected

**DETROIT RIVER PERFORATIONS:**

4455'-4457' 4X/ft

4560'-4562' 4X/ft

**INTERMEDIATE CASING**

9 5/8"

SET @ 5453' KB

CMT w/335 SX TO SURFACE

**PROD. CASING**

NA

**PLUGGING**

WELL WAS PLUGGED WITH CONTINUOUS CEMENT PLUG FROM TD TO 5300' USING 370 SX POX MIN 16% GEL .78% HK-7 + 265 SX POZ MIX SALT SATURATED CEMENT  
BP SET ON TOP OF CEMENT @ 4750'  
BP WAS SET AT 4650'  
SOLID CEMENT PLUG SET FROM 4650' TO SURFACE  
USING 1380 SX HOWCO LITE CEMENT  
WITH 225 SX COMMON CEMENT ON TOP.  
CASING CUT OFF 3' BELOW SURFACE AND  
CAP WELDED OVER.

CASING LEFT FROM 1492'-5453'

TD @ 8371' KB



WARK 1-30 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
8/13/1982	SPUD.
9/13/1982	DRILLING COMPLETED. FORMATION COMPLETED IN CINCINNATIAN. 16" CONDUCTOR SET AT 49' 13 3/8" SET AT 830'; 860 SX 9 5/8" SET AT 5453'; 335 SX
9/16/1982	PERFORATIONS AT 4455'-4457' AND 4560'-4562' (4X/ft)  PLUGGING STARTED WELL WAS PLUGGED WITH CONTINUOUS CEMENT PLUG FROM TD TO 5300' USING 370 SX POX MIN 16% GEL .78% HK-7 + 265 SX POZ MIX SALT SATURATED CEMENT BP SET ON TOP OF CEMENT @ 4750' BP WAS SET AT 4650' SOLID CEMENT PLUG SET FROM 4650' TO SURFACE USING 1380 SX HOWCO LITE CEMENT WITH 225 SX COMMON CEMENT ON TOP. CASING CUT OFF 3' BELOW SURFACE AND CAP WELDED OVER. CASING LEFT FROM 1492'-5453' PLUGGING COMPLETED.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in **DUPLICATE** Within 30 Days after Well Completion

OCT 21 1982

PERMIT NUMBER

35977

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT Willmet, Inc. 2250 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) T. D. Provins Drilling Company 2113 Enterprise Drive Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Wark #1-30						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NE NW NE		SECTION 30	TOWNSHIP 17N	RANGE 8W	TOWNSHIP NAME Evart		
FOOTAGES (North/South) 330 Ft. from North Line and		(East/West) 983 Ft. from West Line of quarter section		COUNTY NAME Osceola			
SUBSURFACE LOCATION		SECTION	TOWNSHIP	RANGE	TOWNSHIP NAME		
FOOTAGES (North/South)		(East/West)		COUNTY NAME			
DATE	DRILLING BEGUN 8-13-82		TOTAL DEPTH OF WELL Driller 8371 Log 8374		TYPE WELL Dry Hole		ELEVATIONS
	DRILLING COMPLETED 9-13-82		FORMATION AT T.D. Cincinnatian		FT. DRILD. - ROTARY TOOLS From 0 To 8374		
	WELL COMPLETED		PRODUCING FORMATION(S) None		FT. DRILD. - CABLE TOOLS From To		
					K.B. 1116.2	R.F. 1115	
					R.T.	Grd. 1100	

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
16"	49		--				YES	NO
13 3/8"	830	860 Sx	--	9-16-82	4x/ft.	4455 - 57 &	X	
9 5/8"	5453	335 Sx	--			4560 - 62		

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)				
None							Sam- ples	Odor	Pits	Mud Line	Gas Log
				Reed City	Gas	3933					
				Sour Zone	Gas	4523					
				Manitoulin	Gas	8320					XX

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
9-16-82	4455 - 62	500 gal. 20% HCL	None				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	200-8374			2054	3/4°			
Birdwell		Sonic	200-8374			4348	1°			
		DLL-MLL	200-8374			5882	1/2°			
						7591	1°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE 10-11-82	NAME AND TITLE (PRINT) William E. Booker, Geologist	SIGNATURE <i>William E. Booker</i>
------------------	--	---------------------------------------

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER

35977

FIELD NAME

OCT 04 1982

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

Willmet, Inc., 2250 Enterprise Dr., Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

Wark

WELL NUMBER

1-30

WELL LOCATION

NE ¼ NW ¼ NE ¼ SEC. 30 T. 17N R. 8W

TOWNSHIP

Evart

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry hole

TOTAL DEPTH

8375

FORMATION

Cincinnatian

DATE PLUGGING STARTED

8-12-82

DATE PLUGGING COMPLETED

8-21-82

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Jack Snider

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
24"	49'	nil	---
13 3/8"	832'	nil	nil
9 5/8"	5,453'	1,492'	shot

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	TD-5300	635 sacks
B.P.	4750	Permanent
B.P.	4650	Permanent
Cement	4650-Surface	1380 sacks

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☒ YES ☐ NO

If yes, give details:

Casing left from 1492'-5453'

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton Cementing  
Baker Tools

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Chet Lowery

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED

Well was plugged with continuous cement plug from T. D. to 5,300' using 370 sacks Poz. min. 16% gel .78% HK-7 plus 265 sacks Poz. mix salt saturated cement. A Baker permanent type B. P. was set on top of cement at 4750'. A Baker permanent type B. P. was set at 4650'. Solid cement plug set from 4650' to surface using 1380 sacks HOWCO lite cement with 225 sacks, common cement on top. Casing cut off 3' below surface and cap welded over.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

Donald Smith, Exploration Engineer

COMPANY NAME AND ADDRESS

Willmet, Inc.  
2250 Enterprise Dr.  
Mt. Pleasant, MI 48858

SIGNATURE

*[Signature]*

DATE (Month, Day, Year)

Sept 30/82

## OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

**Supplemental Plugging Data and Site Conditions:**

5/9/83 site is clean and recontoured, except for a pile of soil. Landowner came by and said that he asked that the pile of topsoil be left for his use and seemed satisfied with the restoration; can recommend approval. (M. Moss)

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

SIGNATURE

DIVISION

DATE \_\_\_\_\_

Michael J. Russo

5/9/83

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

OCT 21 1982

LANSING HAS COPY

WELL PLUGGING RECORD

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

PERMIT NUMBER

35977

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

Willmet, Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

Wark

WELL NUMBER

1-30

WELL LOCATION

NE ¼

NW ¼

NE ¼ SEC. 30

T. 17N

R. 8W

TOWNSHIP

Evart

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole

TOTAL DEPTH

8327

FORMATION

Cincinnatian

DATE PLUGGING STARTED

9-14-82

DATE PLUGGING COMPLETED

9-17-82

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Michael Moss

CASING RECORD

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
16"	49		
13 13/8"	830	860 Sx	---
9 5/8"	5453	335 Sx	1492

BRIDGES OR PLUGS

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	8374 to 4750	635 Sx
Baker Perm B.P.	4750	---
Baker Perm B.P.	4650	---
Cement	4650-Surface	1600 Sx

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES

☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES

☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES

☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Marvin Woods

DESCRIBE IN DETAIL HOW WELL WAS PLUGGED Circulated cement from total depth to 4750 and went in and set bridge plug in cement at 4750. Used 370 sx poz with 16% gel and 265 sx poz mix, salt saturated, attempted to complete Detroit River Sour - perf 4455 - 4462, negative results. Cut 9 5/8" at 1492. - set bridge plug at 4650 and circulated to surface using 1380 sx Howco Lite and 220 sx Class A casing cut 3' below surface and capped.

(USE REVERSE SIDE IF NEEDED)

CERTIFICATION

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William E. Booker, Geologist

COMPANY NAME AND ADDRESS

Strickler Geological Services, Inc.  
1425 S. Mission Street  
Mt. Pleasant, MI 48858

SIGNATURE

*William E. Booker*

DATE (Month, Day, Year)

10-11-82

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

PERMIT TO PLUG AND ABANDON

PERMIT NUMBER  
35977

FIELD NAME

PERMIT DISTRIBUTION  
Permittee - Orig & 1 copy  
Division Office - 2 copies  
Field Office - 1 file copy  
Others - On request

NAME AND ADDRESS OF PERMITTEE  
Willmet, Inc.

LEASE NAME AND WELL NO  
Wark #1-30

LOCATION (T, R, or other)  
NE NW NE

SECTION  
30 T 17N R 8W

TOWNSHIP COUNTY  
Osceola, Evart

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)  
Dry hole

DATE COMPLETED  
8/12/82

DATE PLUGGING WILL START  
8/12/82

PLUGGING PERMIT REQUESTED BY & DATE  
Don Smith 8/12/82

LAST PRODUCTION

BWPD BWPD MCFGPD

DATE

PLUGGING TO BE DONE BY  
Halliburton

PERMIT MAILED TO Willmet, Inc.  
2250 Enterprise  
Mt. Pleasant, MI 48858

COPIES MAILED TO

CASING AND CEMENTING RECORD

PIPE DIA	CASING DIA. & WT / FT	DEPTH SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT TOP	PERFORATIONS
24"		49	DP		
	133/8"	832	860	circ	
	95/8"	5453	335	4220	

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

CONFIDENTIAL

PLUGGING REQUIREMENTS\*

Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

Previously plugged back w/continuous cmt. plug from TD to 5300' and BP at 4750' and tested 4655-4662'. Set permanent BP at 4650'. Rip and pull 95/8". Run tubg. to 4650' and spot continuous cmt. plug to surface. Cut 113/4" and 24" 3' below surf. and weld 1/2" steel plate.

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965. GROUND WATER QUALITY CONTROL: It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460 701 to 460 718 and comply with each of the requirements of the act.

AUTHORIZED BY (signature)

OFFICE Cadillac D#6

DATE 10/6/82

\*NOTE: WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion.

H-7229  
Rev. 11/77

This document paid for with State funds

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
SUPERVISOR OF WELLS

FEB 11 1983  
LANSING HAS COPY

## WELL REWORK RECORD

FILE IN DUPLICATE WITHIN 30 DAYS AFTER COMPLETION OF REWORK OR DEEPENING  
(Replaces GS 38)

PERMIT NUMBER 35977	DEEPENING PERMIT NUMBER	FIELD NAME Wildcat
NAME AND ADDRESS OF WELL OWNER Willmet, Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858		
LEASE OR FARM NAME Wark		WELL NUMBER 1-30
WELL LOCATION NE NW NE	SECTION 30	T. 17N R. 8W TOWNSHIP Evart
		COUNTY Osceola
WELL COMPLETED FOR (Oil, Gas, Gas Storage, Brine Disposal, Water Injection, etc.) Dry Hole	TOTAL DEPTH AFTER REWORK 4750	MECHANICAL LOGS RUN NO ADDITIONAL LOGS
WELL COMPLETED IN (Name Rock Formation and Zone of Completion) Dry Hole in Sour Zone	DATE REWORK COMMENCED 9-17-82	DATE REWORK COMPLETED 9-19-82
NAME AND ADDRESS OF CONTRACTOR T. D. Provins, 2113 Enterprise Drive, Mt. Pleasant, MI 48858		

### WELL CASING RECORD - BEFORE REWORK

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
16"	49'						
13 3/8"	830'	860	200 C1 A	660	POZ		
9 5/8"	5453'	335	C1 A				

### WELL CASING RECORD - AFTER REWORK (Indicate additions and changes only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
9 5/8"	5453	335	4x/ft	4455	4457	500 gal. 20% HCL	
			"	4560	4562		

### DESCRIBE REWORK OPERATIONS IN DETAIL

Run in and circulated cement from TD to 4750, Set bridge plug at approximately 4750. Perforated from 4455-57 and 4560-62, swabbed back 50 bbls load water and 30 bbls. formation water. Ran in and set bridge plug at 4650 and circulated cement to surface (1380 sx).

IMPORTANT! SEE REVERSE SIDE



## GEOLOGICAL FORMATION RECORD OF DEEPENING

FROM	TO	FORMATION (type, color, hardness)	FROM	TO	FORMATION (type, color, hardness)

# DAILY PRODUCTION TEST RECORD

## DAILY INJECTION TEST RECORD IF INJECTION WELL (OR BDW)

[illegible]

SIGNATURE (Well Owner or Authorized Representative)

ADDRESS (If different than well owner)

DATE (Month, Day, Year)

1425 S. Mission  
Mt. Pleasant, MI 48858

1-20-83

NOTE: IF GAS WELL, RECORD FLOW TEST UNDER "DAILY PRODUCTION TEST RECORD"

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION

LAWS 1746  
OCT 04 1982  
lfc

OCT 07 1982

LEAVE BLANK
DEEPENING PERMIT NUMBER
DATE ISSUED

APPLICATION  
TO

CHANGE WELL STATUS  
(SUBMIT IN QUADRUPLICATE)

PERMIT NUMBER 35977
------------------------

FIELD NAME
------------

NAME AND ADDRESS OF WELL OWNER Willmet, Inc., 2250 Enterprise Dr., Mt. Pleasant, MI 48858			
LEASE OR FARM NAME Wark		WELL NUMBER 1-30	
WELL LOCATION NE 1/4 of NW 1/4 of NE 1/4	SECTION 30	TOWNSHIP T. 17N R. 8W	COUNTY Osceola
(Deepen, Plug Back, Convert to Injection or Disposal Well, Temporarily Abandon, etc.)			
APPROVAL REQUESTED TO Plug back			
DATE DRILLING COMPLETED 8-12-82	DATE LAST PRODUCED	LAST PRODUCTION (Amt/day) OIL, WTR., M.C.F. GAS	
WORK TO BE DONE BY			WILL START (DATE) 8-16-82

CASING AND CEMENTING RECORD			
SIZE CASING	DEPTH SET	NO. SACKS CEMENT	PERFORATIONS
24"	49'	driven	
13 3/8"	832'	cement to surface	
9 5/8"	5,453'	cement top, 4220'	

FORMATION RECORD  
(Formation and depth, Oil, Gas & Wtr. shows, etc.)

DESCRIBE PROPOSED WORK IN DETAIL:

Continuous cement plug from T. D. 8375' to 5300'. Plug consists of 370 sacks Poz. min. 16% gel .78% HK-7 plus 265 sacks Poz. mix salt saturated cement. A Baker permanent type B. P. was set on top of cement at 4750'. A Baker permanent type B. P. was set at 4650'. Solid cement plug set from 4650' to surface using 1380 sacks HOWCO lite cement with 225 sacks, common cement on top. Casing cut off 3' below surface and cap welded over.

\*Perf. 4655-57 and 4660-62 at 4 spf and test these zones before completing plugging.

The proposed work as outlined above and approved by the Supervisor or his Authorized Representative will be executed in accordance with the provisions of Act 61, P.A. 1939 and the rules and regulations issued and adopted thereunder.

SIGNATURE (Well Owner or Authorized Representative) <i>John M. Snider</i>		DATE Sept 30/82	
APPROVED BY <i>John M. Snider</i>	FIELD OFFICE <i>Cadillac</i>	DATE 10/4/82	

NOTE: WELL WORK RECORD, Form R-7212, is to be filled in DUPLICATE within 30 days after completion.

R 7237 3/73

**APPLICATION FOR PERMIT TO DRILL OR DEEPEN  
A WELL FOR OIL, GAS, BRINE DISPOSAL,  
HYDROCARBON STORAGE OR SECONDARY RECOVERY**

Under Authority of Act 61, P.A. of 1939, As Amended

MAIL TO:  
STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
30028, Lansing, Michigan 48909

R 7207  
Rev. 9/79

AUG 3 1982

1. SEE INSTRUCTIONS ON REVERSE SIDE

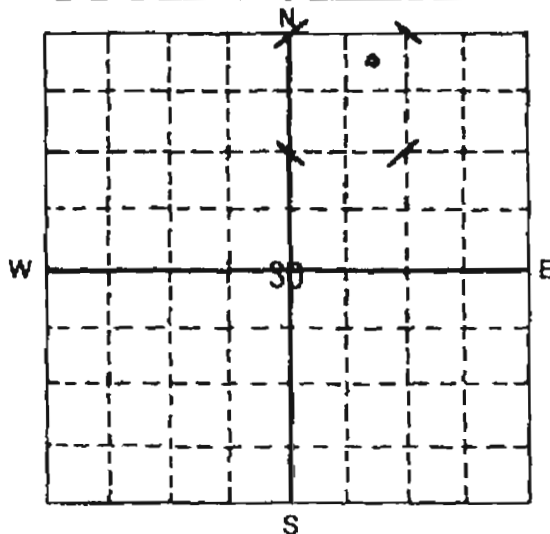
3. Application for permit to drill for:  
☒ Oil and Gas ☐ Brine Disposal ☐ Hydrocarbon Storage ☐ Secondary Recovery  
4. Application to: (no fee required)  
☐ Deepen ☐ Revise Application ☐ Cancel and Transfer  
5. Fee enclosed:  
☐ No ☒ Yes \$100.00

6. Do prior permits exist for this well?  
☐ No ☒ Yes ☐ Drilled ☐ Termin'd

7. List each permit number

Mineral Well Act #10029

LOCATE WELL AND OUTLINE UNIT  
ON SECTION PLAT — 640 ACRES



8. Applicant: (name each "owner" as they are bonded)

WILLMET, INC.

9. Address: (operator only if more than one "owner")

Phone:

2250 Enterprise Dr., Mt. Pleasant, MI 48858 (517) 773-3949

10. Lease or well name: (be brief as possible)

Well number:

Wark

1-30

11. Surface owner:

John A. & Linda Wark

12. Address:

Phone:

115th Avenue, Ewart, MI 49631

(616) 734-5766

13. Surface location description

NE 1/4 of NW 1/4 of NE 1/4 Section 30 T. 17N R. 8W

14. Township

County

Ewart

Osceola

15. Bottom hole location description if directional drill

1/4 of 1/4 of 1/4 Section T. R.

16. Township

County

17. LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT.

a. Surface Location: 330 ft. from (N/S) N Line of quarter section. AND 983 ft. from (E/W) W Line of quarter section.

b. Bot. Hole Location: ft. from (N/S) Line of quarter section AND ft. from (E/W) Line of quarter section.

c. Drilling Unit: 330 ft. from (N/S) N Line of drilling unit AND 330 ft. from (E/W) E Line of drilling unit.

18. Drilling contractor:

Address:

Telephone:

T. D. Provins Drilling Co., Inc., 2111 Enterprise Dr., Mt. Pleasant, MI (517) 773-6946

19. Kind of tools (Rotary, cable, combination)

20. Intended depth

21. Intended formation

22. Is sour oil or gas expected?

Rotary

8,600

Cincinnati

☒ No ☐ Yes (See Instructions, Item 6)

23. Blowout control (Detail equipment type, size, trim, rating, testing, choke manifold, etc. See instructions, Item 7)

See Exhibits "A" and "B" attached hereto

24. PROPOSED DRILLING, CASING, CEMENTING AND SEALING PROGRAM

HOLE			CASING			CEMENT		MUD		
Depth	Geol. Form	Bit Dia.	O.D. Size	WL/Ft. — Grade — Condition	Depth	Sacks	W.O.C.(hrs.)	Wt.	Vis.	W.L.
60-80		Drive	20	94.0# Conductor-New	60-80	--	--	--	--	--
80-900		17 1/2	13 3/8	48.0# H-40 -New	900	Cir.	18	9.5	55	25
900-5500		12 1/4	9 5/8	47.0# L-80 -New	5500	200	18	10.5	33	10
				and Tuboscoped						
5500-8600		8 1/2	5 1/2	17.0# N-80 -New	0-8600	As nec.	72	10.5	33	10

25. Send correspondence and permit to:

Address:

Willmet, Inc. 2250 Enterprise Dr., Mt. Pleasant, MI 48858

LEAVE BLANK

Date Issued	Permit	Number
	<input type="checkbox"/> TO DRILL	35922
	<input type="checkbox"/> TO DEEPEN	

FOR CASHIER'S USE ONLY. DO NOT WRITE IN THIS SPACE

26. Name of applicant's agent: (Print)

Phone:

James T. Junker

(517) 773-3949

27. Signature of agent:

Date:

*James T. Junker*

8-2-82

For Geological Survey Use Only

- 1. White — Lansing file
- 2. Canary — Cashier copy
- 3. Blue — District review

- 4. Pink — Region review
- 5. Goldenrod — District file (w/permit)
- 6. Green — Applicant file (w/permit)

UG-6-82

H

2272

100.00

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
SUPERVISOR OF WELLS

**WELL REWORK RECORD**

FILE IN DUPLICATE WITHIN 30 DAYS AFTER COMPLETION OF REWORK OR DEEPENING  
(Replaces GS 38)

LANSING  
JAN 24 1983

CADILLAC HAS COPY  
JAN 26 1983

PERMIT NUMBER 35977	DEEPENING PERMIT NUMBER	FIELD NAME Wildcat
NAME AND ADDRESS OF WELL OWNER Willmet, Inc., 2250 Enterprise Drive, Mt. Pleasant, MI 48858		
LEASE OR FARM NAME Wark		WELL NUMBER 1-30
WELL LOCATION NE NW NE	SECTION 30 T. 17N R. 8W	TOWNSHIP Evart COUNTY Osceola
WELL COMPLETED FOR (Oil, Gas, Gas Storage, Brine Disposal, Water Injection, etc.) Dry Hole	TOTAL DEPTH AFTER REWORK 4750	MECHANICAL LOGS RUN NO ADDITIONAL LOGS
WELL COMPLETED IN (Name Rock Formation and Zone of Completion) Dry Hole in Sour Zone	DATE REWORK COMMENCED 9-17-82	DATE REWORK COMPLETED 9-19-82
NAME AND ADDRESS OF CONTRACTOR T. D. Provins, 2113 Enterprise Drive, Mt. Pleasant, MI 48858		

**WELL CASING RECORD - BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
16"	49'						
13 3/8"	830'	860	200 CI A-660 POZ				
9 5/8"	5453'	335	CI A				

**WELL CASING RECORD - AFTER REWORK (Indicate additions and changes only)**

Casing		Cement		Perforations		Acid or Fracture Treatment Record	Perforations If plugged, how?
Size	Depth	Sacks	Type	From	To		
9 5/8"	5453	335	4x/ft	4455	4457	500 gal. 20% HCL	
			"	4560	4562		

**DESCRIBE REWORK OPERATIONS IN DETAIL**

Run in and circulated cement from TD to 4750, Set bridge plug at approximately 4750. Perforated from 4455-57 and 4560-62, swabbed back 50 bbls load water and 30 bbls. formation water. Ran in and set bridge plug at 4650 and circulated cement to surface (1380 sx).

IMPORTANT! SEE REVERSE SIDE

## GEOLOGICAL FORMATION RECORD OF DEEPENING

FROM	TO	FORMATION (type, color, hardness)	FROM	TO	FORMATION (type, color, hardness)

### DAILY PRODUCTION TEST RECORD

[illegible]

**DAILY INJECTION TEST RECORD IF INJECTION WELL (OR BDW)**

[illegible]

**SIGNATURE** (Well Owner or Authorized Representative)

William Book

ADDRESS (if different than well owner)

1425 S. Mission  
Mt. Pleasant, MI 48858

DATE (Month, Day, Year)

1-20-83

NOTE: IF GAS WELL, RECORD FLOW TEST UNDER "DAILY PRODUCTION TEST RECORD"



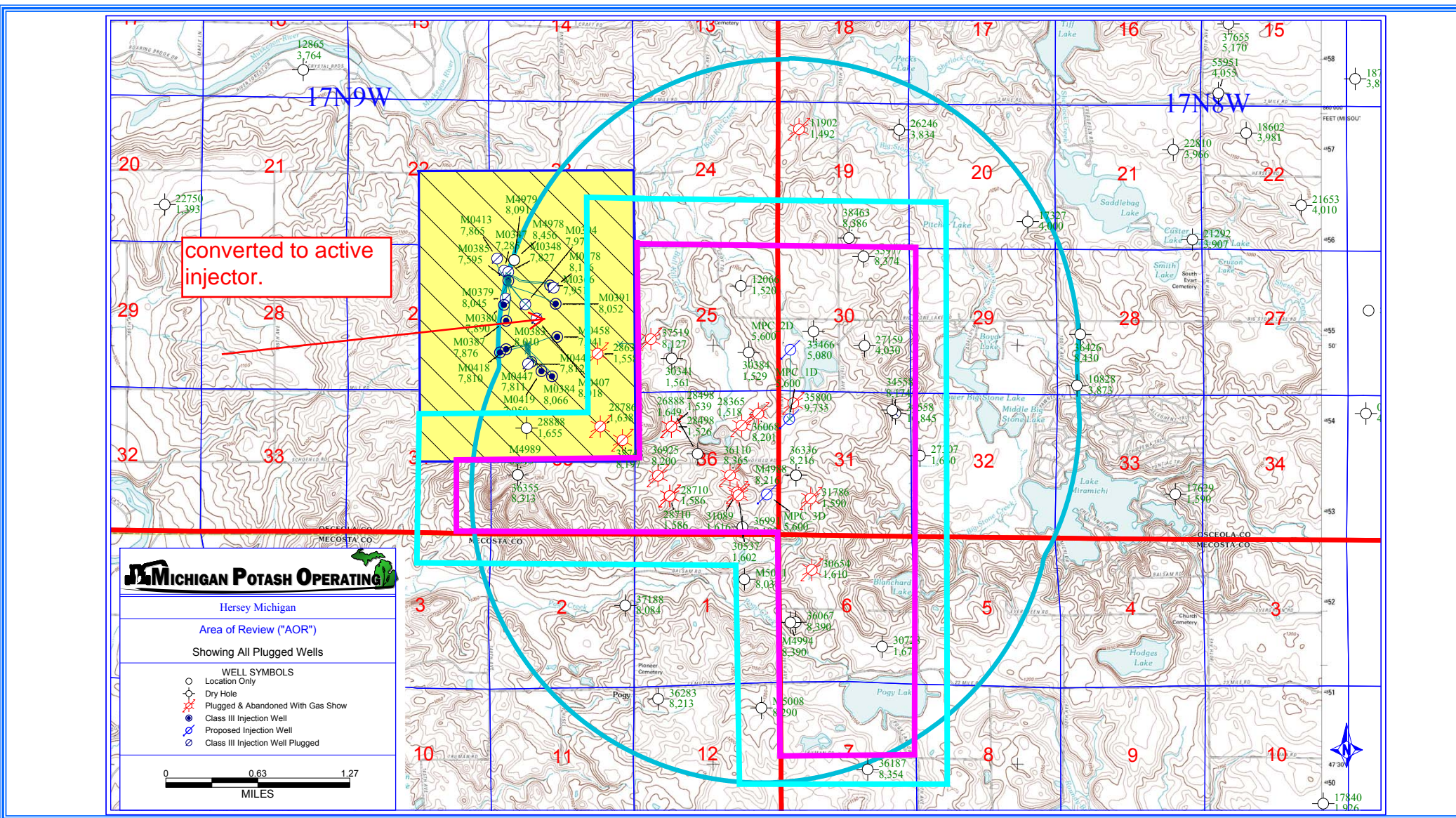


Figure B4. Map showing all plugged wells, shallow (that do not penetrate any confining horizon) or deep (that penetrate confining horizon) within the area of review. Total Depths are listed. There are several shallow Michigan Stray wells that do not penetrate the injection or confining horizon.

**WOODWARD 1-26**  
**NW NE SW Sec 26 T17N R9W**  
**OSCEOLA COUNTY, MI**  
**CURRENT WELLBORE DIAGRAM**

**UPDATED APRIL 2014 BY JLT**

20" CONDUCTOR DRIVEN TO 77'

14-3/4" Hole expected

**SURFACE CASING**

11 3/4"; 42#/ft.

SET @ 931' KB

CMT w/ 575 SX TO SURFACE

10-5/8" Hole expected

**INTERMEDIATE CASING**

8 5/8"; 32#/ft.

SET @ 5456' KB

CMT w/1600 SX

TOC @ 700'

**PROD. CASING**

NA

**PLUGGING**

RAN OPEN EDED DRILL PIPE TO 8140' AND

SPOTTED 100 SX TO 7800'

PULLED DRILL PIPE TO 7800' AND SPOTTED 195 SX TO 7000'

PULLED DRILL PIPE TO 7000' AND SPOTTED 75 SX TO 6800'

PULLED DRILL PIPE TO 6800' AND SPOTTED 400 SX TO 5460'

PULLED DRILL PIPE TO 5460' AND SPOTTED 100 SX TO 5060'

PULLED DRILL PIPE TO 5060' AND SPOTTED 900 SX TO 500'

PULLED DRILL PIPE TO 500' AND SPOTTED 150 SX TO SURFACE

WELL RE-ENTERED AND CONVERTED TO ACT 315 DISPL WELL  
MW PERMIT #349-855-867 (9/11/87)

**TD @ 8135' KB**

API No. 21-133-36942-0000  
GL @ 1175.2'  
KB @ 1191.7'  
WELL COMPLETION DATE: NA  
PLUGGING COMPLETION DATE: 11/1/83



# WOODWARD 1-26 WELL HISTORY

<u>DATE</u>	<u>DESCRIPTION</u>
10/11/1983	SPUD.
10/31/1983	DRILLING COMPLETED. FORMATION AT TD CABOT HEAD. 20" CONDUCTOR SET AT 77' 11 3/4" SET AT 931'; 575 SX 8 5/8" SET AT 5456'; 1600 SX
10/31/1983	PLUGGING START DATE RAN OPEN EDED DRILL PIPE TO 8140' AND SPOTTED 100 SX TO 7800' PULLED DRILL PIPE TO 7800' AND SPOTTED 195 SX TO 7000' PULLED DRILL PIPE TO 7000' AND SPOTTED 75 SX TO 6800' PULLED DRILL PIPE TO 6800' AND SPOTTED 400 SX TO 5460' PULLED DRILL PIPE TO 5460' AND SPOTTED 100 SX TO 5060' PULLED DRILL PIPE TO 5060' AND SPOTTED 900 SX TO 500' PULLED DRILL PIPE TO 500' AND SPOTTED 150 SX TO SURFACE
11/1/1983	PLUGGING COMPLETED
9/11/1987	WELL WAS RE-ENTERED AND CONVERTED TO AN ACT 315 DISPL. WELL MW PERMIT #349-855-867

APPLICATION FOR PERMIT TO DRILL OR DEEPEN  
A WELL FOR OIL, GAS, BRINE DISPOSAL,  
HYDROCARBON STORAGE OR SECONDARY RECOVERY

Under Authority of Act 61, P.A. of 1939, As Amended

#631  
AUG 3 1983  
MAIL TO:  
STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION  
Box 30028, Lansing, Michigan 48909

R 7207  
Rev. 2/81

1. SEE INSTRUCTIONS ON REVERSE SIDE

2. ☒ Fed. Employer Ident. No. ☐ Soc. Security No.  
25-1391931

3. Application for permit to drill for:  
☒ Oil and Gas ☐ Brine Disposal ☐ Hydrocarbon Storage ☐ Secondary Recovery ☐ Deepen ☒ Revise Application ☐ Cancel and Transfer

5. Fee enclosed:  
☐ No ☒ Yes \$ 100.00

6. Do prior permits exist for this well?  
☒ No ☐ Yes ☐ Drilled ☐ Termin'd

8. Applicant: (name each "owner" as they are bonded)

PPG Oil & Gas Co., Inc. & Miller Bros.

9. Address: (operator only if more than one "owner")

Phone:

2258 Enterprise Drive, Mt. Pleasant, MI 48858 (517) 773-3949

10. Lease or well name: (be brief as possible)

Well number:

Woodward et al

1-26

11. Surface owner:

Jerry and Brigid Woodward

12. Address:

Phone:

1661 W. Vance Rd.

(616) 832-4970

13. Surface location description (See instructions, item 4)

NW 1/4 of NE 1/4 of SW 1/4 Section 26 T. 17N R. 9W

14. Township

County

Hersey

Osceola

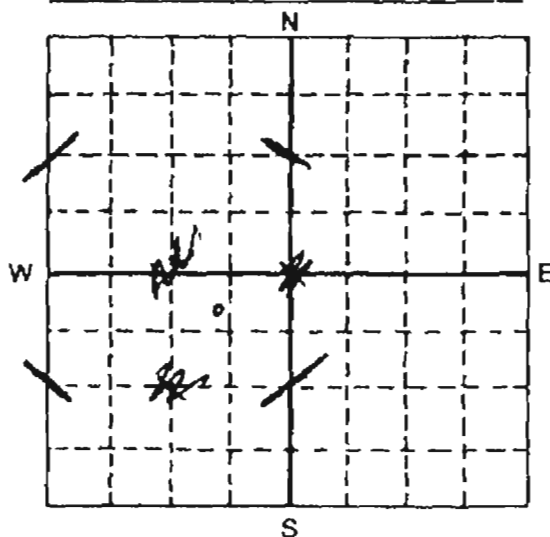
15. Bottom hole location description if directional drill (See instructions, item 5)

1/4 of 1/4 of 1/4 Section T. R.

16. Township

County

LOCATE WELL AND OUTLINE UNIT  
ON SECTION PLAT — 640 ACRES



17. LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT. (See instructions, items 4 & 5)

a. Surface Location: 460 ft. from (N/S) N Line of quarter section. AND 667 ft. from (E/W) E Line of quarter section.

b. Bot. Hole Location: ft. from (N/S) Line of quarter section AND ft. from (E/W) Line of quarter section.

c. Drilling Unit: 842 ft. from (N/S) S Line of drilling unit AND 667 ft. from (E/W) E Line of drilling unit.

18. Drilling contractor:

Address:

Telephone:

T. D. Provins, P. O. Box 642, Mt. Pleasant, MI 48858

(517) 773-6946

19. Kind of tools (Rotary, cable, combination)

20. Intended depth

21. Intended formation

22. Is sour oil or gas expected?

Rotary

8,600'

Cincinnatian

☒ No ☐ Yes

(See instructions, item 6)

23. Blowout control (Detail equipment type, size, trim, rating, testing, choke manifold, etc. See instructions, item 7)

See Exhibits "A" and "B" attached hereto.

24. PROPOSED DRILLING, CASING, CEMENTING AND SEALING PROGRAM

HOLE			CASING			CEMENT		MUD		
Depth	Geol. Form	Bit Dia.	O.D. Size	Wt./Ft. — Grade — Condition	Depth	Sacks	W.O.C.(hrs.)	Wt.	Vis.	W.L.
84'		20"	16"	New	84'					
857'	Drift	14 3/4"	11 3/4"	42# New	857'	500	to surface			
5500'	Bass Islands	10 5/8"	8 5/8"	32# N-80 New, Insp.	5500'		to surface			
8600'	Cincinnatian	7 7/8"	5 1/2"	17# N-80 New, Insp.	8600'	350	to approx. 8 5/8" inter.	600'	inside	

25. Send correspondence and permit to:

Address

PPG Oil & Gas Company, Inc., 2258 Enterprise Drive, Mt. Pleasant, MI 48858

LEAVE BLANK

Date Issued: 8-15-83  
Permit: ☒ TO DRILL ☐ TO DEEPEN  
Number: 36942

26. Name of applicant's agent: (Print)

Phone:

Donald P. Smith  
Exploration Engineer

(517) 773-3949

27. Signature of agent:

Date:

Donald P. Smith, Jr. 7-29-83

FOR CASHIER'S USE ONLY. DO NOT WRITE IN THIS SPACE

For Geological Survey Use Only

1. White — Lansing file  
2. Canary — Cashier copy  
3. Blue — District review

4. Pink — Region review  
5. Goldenrod — District file (w/permit)  
6. Green — Applicant file (w/permit)

**STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY DIVISION**

**PERMIT TO PLUG AND ABANDON**

**DNR DISTRIBUTION**  
Permittee — Orig & 1 copy  
Division Office — 2 copies  
Field Office — File copy  
Others — On request

**PERMIT NUMBER** 36942  
**FIELD NAME** Hersey

**NAME AND ADDRESS OF PERMITTEE**

**PPG AND MILLER BROS.**

**LEASE NAME AND WELL NO.**

**Woodward 1-26**

DEC 16 1983

<b>LOCATION</b> (¼ ¼ ¼ or other)	<b>SECTION</b>	<b>TOWNSHIP</b>	<b>COUNTY</b>
NW NE SW	26	17N 9W	Hersey Osceola
<b>TYPE OF WELL</b> (Oil, Gas, Dry Hole, etc.)	<b>DATE COMPLETED</b>	<b>DATE PLUGGING WILL START</b>	<b>PLUGGING PERMIT REQUESTED BY &amp; DATE</b>
Dry	10/30/83	10/31/83	W. Masterson 10/30/83
<b>LAST PRODUCTION</b>	<b>PLUGGING TO BE DONE BY</b>		
BOPD	BWPD	MCFGPD	DATE
			Bigard 14
<b>PERMIT MAILED TO</b>		<b>COPIES MAILED TO</b>	

**CASING AND CEMENTING RECORD**

HOLE DIA.	CASING DIA. & WT./FT.	DEPTHS SET	CEMENT QUANTITY, TYPE, ADDITIVES	CMT. TOP.	PERFORATIONS
	20"	??			
	11 3/4"	931'	575 SX	surf	
	8 5/8"	5456'	1600 SX	700'	

GEOLOGIC DATA; GAS AND OIL SHOWS; DRILLING AND COMPLETION DATA:

**CONFIDENTIAL**

**PLUGGING REQUIREMENTS\***

\*Plugging requirements outlined are to be executed in accordance with the provisions of Act 61, P.A. 1939, as amended, and rules and orders adopted thereunder.

**PI AS PER MINERAL WELLS:** 100 sx cmt. at 8140; 195 sx cmt at 7800';  
75 sx at 7000'; 400 sx at 6800'; 100 sx cmt 5460'; 900 sx at 5060';  
150 sx at 500'.

\*NOTE: BONDS CANNOT BE RELEASED UNTIL A PLUGGING IS COMPLETED, CELLAR RAT HOLE AND PITS FILLED, WELL SITE RESTORED AND RECORDS FILED. WATER WELLS MUST BE PLUGGED ACCORDING TO RULE 166 OF ACT 294 P.A. 1965, "GROUND WATER QUALITY CONTROL". It is further made a requirement of this permit that the applicant give notice to the public utilities in accordance with Act 53, P.A. 1974 C.L. 460.701 to 460.718 and comply with each of the requirements of the act.

<b>AUTHORIZED BY (signature)</b> <i>Michael J. Ross</i>	<b>OFFICE</b> Cadillac D#6	<b>DATE</b> 12/9/83
--	-------------------------------	------------------------

NOTE WELL PLUGGING RECORD Form R-7213 to be filed in TRIPLICATE within 30 days after completion

R-7229  
Rev. 11/77

This document paid for with State funds.

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
**LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)**  
Submit in DUPLICATE Within 30 Days after Well Completion

NOV 29 1983

PERMIT NUMBER

36942

DEEPENING PERMIT NUMBER

NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT PPG Oil & Gas Co., Inc. 2258 Enterprise Drive Mt. Pleasant, MI 48858				NAME & ADDRESS OF DRILLING CONTRACTOR(S) Bigard Drilling Company 1315 S. Mission Mt. Pleasant, MI 48858			
LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT Woodward #1-26						DIRECTIONALLY DRILLED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
SURFACE LOCATION NW NE SW		SECTION 26		TOWNSHIP 17N		RANGE 9W	
TOWNSHIP NAME Hersey						COUNTY NAME Osceola	
FOOTAGES (North/South) 460 Ft. from North Line and 667 Ft. from East Line of quarter section						FOOTAGES (East/West) Line of quarter section	
SUBSURFACE LOCATION		SECTION		TOWNSHIP		RANGE	
TOWNSHIP NAME						COUNTY NAME	
FOOTAGES (North/South) Ft. from Line and Ft. from Line of quarter section						FOOTAGES (East/West) Line of quarter section	
DATE	DRILLING BEGUN 10-11-83		TOTAL DEPTH OF WELL Driller 8135 Log 8140		TYPE WELL Dry Hole		ELEVATIONS
	DRILLING COMPLETED 10-31-83		FORMATION AT T.D. Cabot Head		FT. DRLD. - ROTARY TOOLS From 0 To 8140		
	WELL COMPLETED		PRODUCING FORMATION(S) None		FT. DRLD. - CABLE TOOLS From To		
					K.B. 1191.7 R.F. 1190.3		
					R.T. Grd. 1175.2		

CASING, CASING LINERS AND CEMENTING

PERFORATIONS

SIZE	WHERE SET	CEMENT	Ft. Pulled	DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN	
20"	77	D.P.	---				YES	NO
11 3/4	931	575 Sx	---			None		
8 5/8	5456	1600 Sx	---					

GROSS PAY INTERVALS

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	FROM	TO	FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X)					
None							Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				Reed City Dol	Gas	4100					X	
				Sour	Gas	4650					X	
				A2 Carbonate	Gas	6995			X		X	

STIMULATION BY ACID OR FRACTURING

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

DATE	Interval Treated	Materials and amount used	FORMATION	F.U.	L.C.	DEPTH	AMOUNT
	None		None				

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION DEVIATION SURVEY PLUGGED BACK

Brand	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECT'N	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger	X	LDT-CNL-GR	200-8135			2450	1°			
Birdwell		Dual Micro	3100-8135			4400	3/4°			
		Sonic	200-8135			6493	3/4°			
						7100	1 3/4°			

PRODUCTION TEST DATA

OIL - Bbls/day	GRAVITY - °API	COND. Bbls/day	GAS - MCF/day	WATER - Bbls/day	H <sub>2</sub> S - Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
11-18-83	William E. Booker, Geologist	<i>William E. Booker</i>

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210  
Rev. 3/77

NOV 29 1983

LANSING HAS COPY

SEP 15 1983 **WELL PLUGGING RECORD**

(Submit in TRIPLICATE Within 30 Days After Plugging is Completed)

**Permits & Bonding Unit**

PERMIT NUMBER

36942

DEC 02 1983

FIELD NAME

COMPLETE NAME(S) AND ADDRESS OF WELL OWNER

PPG Oil & Gas Co., Inc., 2258 Enterprise Drive, Mt. Pleasant, MI 48858

COMPLETE LEASE OR FARM NAME(S)

Woodward

WELL NUMBER

1-26

WELL LOCATION

NW 1/4

NE 1/4

SW 1/4 SEC. 26

T. 17N

R. 9W

TOWNSHIP

Hersey

COUNTY

Osceola

TYPE OF WELL (Oil, Gas, Dry Hole, etc.)

Dry Hole

TOTAL DEPTH

8135

FORMATION

Cabot Head

DATE PLUGGING STARTED

10-31-83

DATE PLUGGING COMPLETED

11-1-83

DEPT. REPRESENTATIVE(S) WHO ISSUED PERMIT OR WITNESSED PLUGGING

Jack Snider

**CASING RECORD**

SIZE CASING	DEPTH SET	AMOUNT RECOVERED	SHOT OR RIPPED
20"	77	---	
11 3/4"	931	---	
8 5/8"	5456	---	

**BRIDGES OR PLUGS**

TYPE (Brush, Stone, Cement, Mechanical, etc.)	DEPTH PLACED	SACKS OF CEMENT AND ADDITIVES
Cement	7800-8140	100 Sx
Cement	7000-7800	195 Sx
Cement	6800-7000	75 Sx
Cement	5460-6800	400 Sx
Cement	5060-5460	100 Sx
Cement	500-5060	900 Sx
Cement	0-500	150 Sx

Were tools, tubing, casing, etc., lost or left in the hole before or during plugging?

☐ YES ☒ NO

If yes, give details:

Did a Service Company pump mud, spot cement, or set bridge plugs?

☒ YES ☐ NO

If yes, give name and address:

Halliburton

Was the well plugged by a Company or Contractor other than Owner or Operator?

☐ YES ☒ NO

If yes, give name and address:

Representatives of Owner, Operator, Company, or Contractor who witnessed plugging:

Willie Masterson

**DESCRIBE IN DETAIL HOW WELL WAS PLUGGED**

Ran open ended drill pipe to 8140' and spotted 100 sx to 7800'. Pulled drill pipe to 7800' and spotted 195 sx to 7000', pulled drill pipe to 7000' and spotted 75 sx to 6800', pulled drill pipe to 6800' and spotted 400 sx to 5410', pulled drill pipe to 5460' and spotted 100 sx to 5060' pulled drill pipe to 5060' and spotted 900 sx to 500, pulled drill pipe to 500' and spotted 150 sx to surface.

(USE REVERSE SIDE IF NEEDED)

**CERTIFICATION**

"I state that I am authorized by said Owner or Operator to make this report; and that this report was prepared under my supervision and direction, and that the facts stated herein are true, correct and complete to the best of my knowledge."

NAME AND TITLE (Typed or Printed)

William E. Booker, Geologist

COMPANY NAME AND ADDRESS

STRICKLER GEOLOGICAL SERVICES, INC.

SIGNATURE

*William E. Booker*

DATE (Month, Day, Year)

11-18-83

1425 S. Mission  
Mt. Pleasant, MI 48853

## OPERATORS USE

Description of Detail (cont.) or Other Supplemental Data:

## DEPARTMENT USE ONLY

**Supplemental Plugging Data and Site Conditions:**

Well was re-entered and converted to an Act 315 displ. well, MW Permit #349-855-867. M Moss

### FINAL INSPECTIONS BY DEPARTMENT REPRESENTATIVES

SIGNATURE

DIVISION

DATE \_\_\_\_\_

Michael J. Moss

GEOLOGICAL SURVEY

9/11/87